



ETNZ 1-METER

AMERICA'S CUP RACING YACHT

INSTRUCTION MANUAL

WARRANTY

Thunder Tiger guarantees this model kit to be free from defects in both material and workmanship. The total monetary value under warrant will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification. Part or parts missing from this kit must be reported within 60 days of purchase. No part or parts will be sent under warranty without proof of purchase.

To receive part or parts under warranty, the service center must receive a proof of purchase and/or the defective part or parts. Should you find a defective or missing part, contact the authorized Thunder Tiger Service/Distributor nearest you.

WARNING

The 1 meter ETNZ America' Racing Yacht, its parts and its construction tools can be deadly weapons. Always exercise extreme caution when using this product. Improper operations may cause personal and/or property damage. Thunder Tiger and its distributor have no control over damages resulting from shipping, improper construction, or improper usage.

Thunder Tiger assumes and accepts no responsibility for personal and/or property damages resulting from the use of improper building materials, equipment, and operations. By the act of assembling this product, the user accepts all resulting liability. If the buyer is not prepared to accept this liability, then he/she should return this kit in new, unassembled, and un used condition to the place of purchase.

Notice

This is not a toy. Assembly and operating of this boat requires adult supervision.



No.5555

Introduction

Thank you for your purchase of the Thunder Tiger 1/25 scale 1-M Emirates Team New Zealand America's Cup Racing Yacht. This ETNZ is both good for indoor display and outdoor sailing. With proper care taken during assembly, the ETNZ will provide you good performance and long service life. Please contact Thunder Tiger authorized distributor for tech support or customer service if you encounter any problem.

Team New Zealand won the America's Cup, the world's oldest sporting trophy, in 1995 and successfully defended it in Auckland, New Zealand, in 2000. A Swiss team took the Cup from New Zealand in 2003. Now with sponsorship from the Dubai-based airline Emirates and Toyota New Zealand, the team is preparing for a challenge in Valencia, Spain, in 2007. For more ETNZ 2007 America's Cup racing information, visit the website at www.emiratesteamnz.com.

Items Required for Assembly

Radio

A 2 CH surface radio system w/one Sail Winch Servo and one STD servo.

ACE Nautical Commander is highly recommended(No.8501).

Features:

- ? Switch on Alarm
- ? Low Battery Alarm
- ? LED Power Indicator
- ? Servo Reversing Switch
- ? EPA for Throttle
- ? Digital Trim Lever
- ? 3 Position Switch for CH6
- ? 270 degree Trim Knob for CH7
- ? CH4 & CH5 Slide Lever for Auxiliary Function



No.8501

Winch Servo

Introduction of Thunder Tiger Sail Winch Servo. This servo is specially design for ETNZ that torque is up to 11kg-cm, the speed is at 0.28sec/60 and max. rotation at 2 turns (720°). Standard quarter size with water proof seal between cases. All plastic gears. Comes with drum and mounting hardware. Fits to most sailing yachts in the market.

Specifications:

- Length: 58mm
- Width: 28mm
- Height: 52mm
- Weight: 120g
- Speed: 0.28s/60°
- Torque: 9.5kg-cm at 4.8V
- 11kg-cm at 6V



No.8141

Battery

AcePower NiMH 3600mAh 4.8V Battery Pack is recommended. High capacity for long time use and perfect fit in ETNZ radio compartment.



No.2980

Tools Required for Assembly



Needle Nose
Pliers



Phillips
Screwdriver, Med



Hobby Knife



Scissors



CA Instant Glue



Drill Bit
1/16", 1.6mm
5/64", 2mm
1/8", 3mm
5/32", 4mm

• Sandpaper (#400 grit)

• Rubbing Alcohol

Before Assembly

- Read all directions thoroughly before assembly.
- Check the parts against the parts drawing on page 3-4.
- When mixing epoxy, apply equal volume from two bottles.
- When tighten screws, be sure not to overtighten, as the metal thread will strip out or damage the fiberglass, plywood, plastic or Aluminum.

In each step, the part No. showed right behind the mark. Locate all parts for the steps.

3



Sequence of the step

Keel and Rudder Tube Assembly



The section will be assembled in the step.

16 17 21 22



Refer to the parts listing and locate the needed parts.

Clear a place on your workbench or table, and let's begin.

Some Basic Knots



Bowline Knot

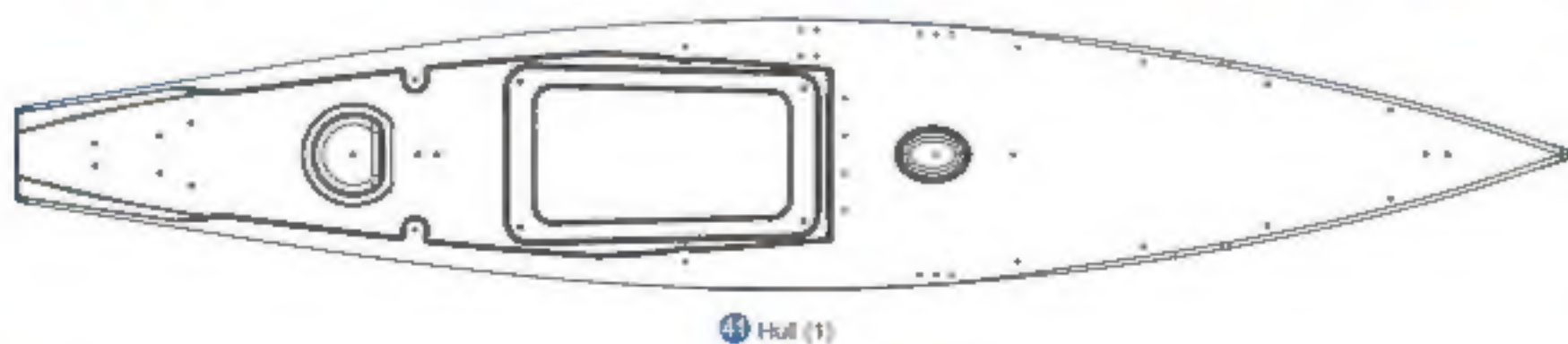
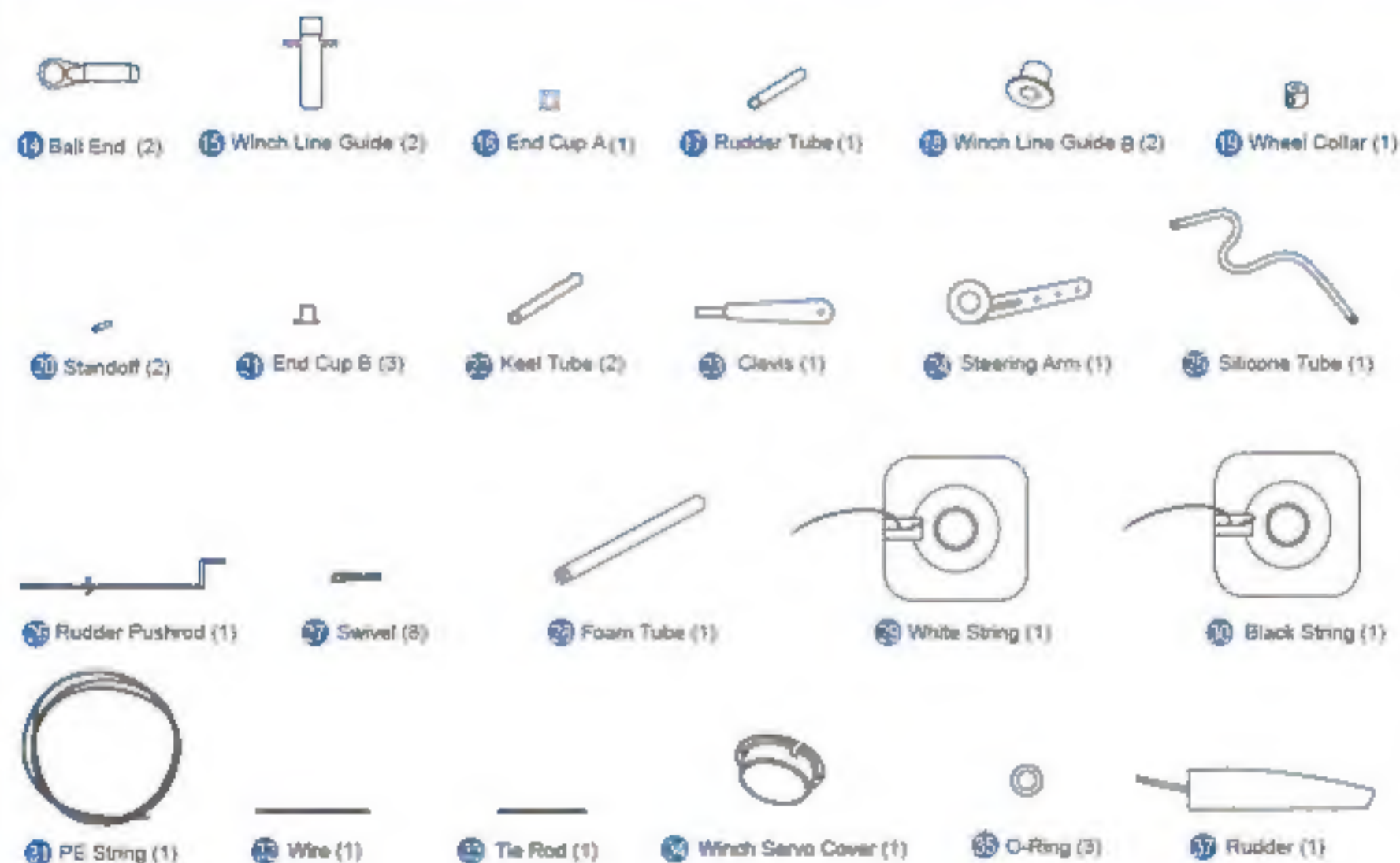
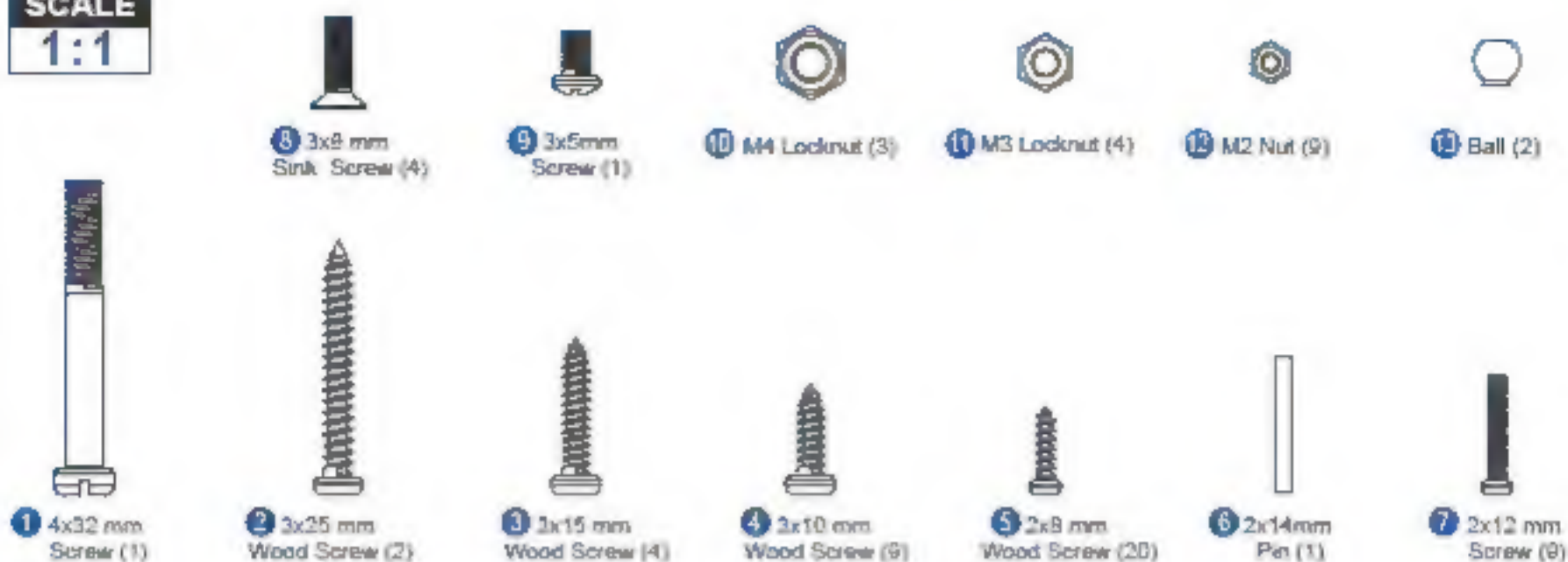


Figure Eight Knot



Reef Knot

SCALE
1:1





42 Hatch Cover (1)



45 Hatch Mount (1)



46 Mast A (1)



47 Mast B (1)



48 Mast Joiner (1)



49 Head Crane (1)



50 Main Boom (1)



51 Jib Boom (1)



52 PVC Strip (3/L)



53 PVC Strip (2/S)



54 Display Stand (2)



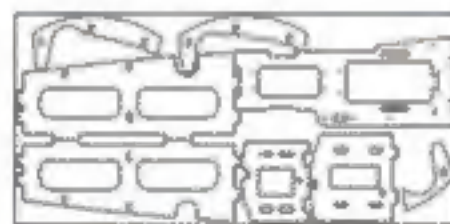
55 Al. Stand B (2)



56 Al. Stand A (4)



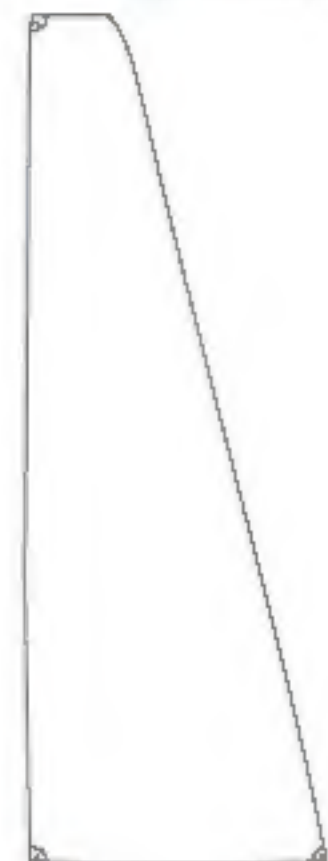
57 Decal (1)



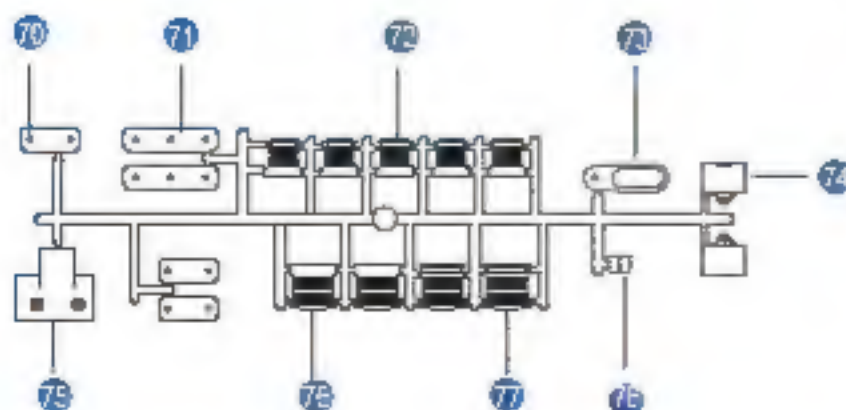
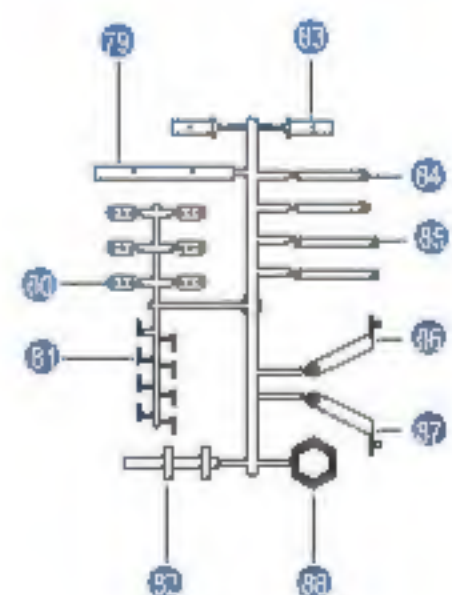
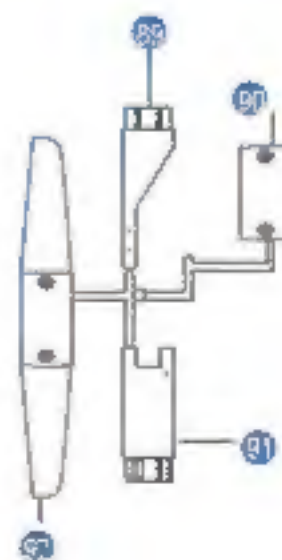
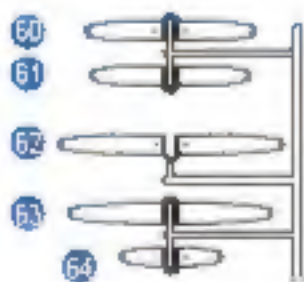
58 Servo Tray (1)



59 Jib Sail (1)



60 Main Sail (1)

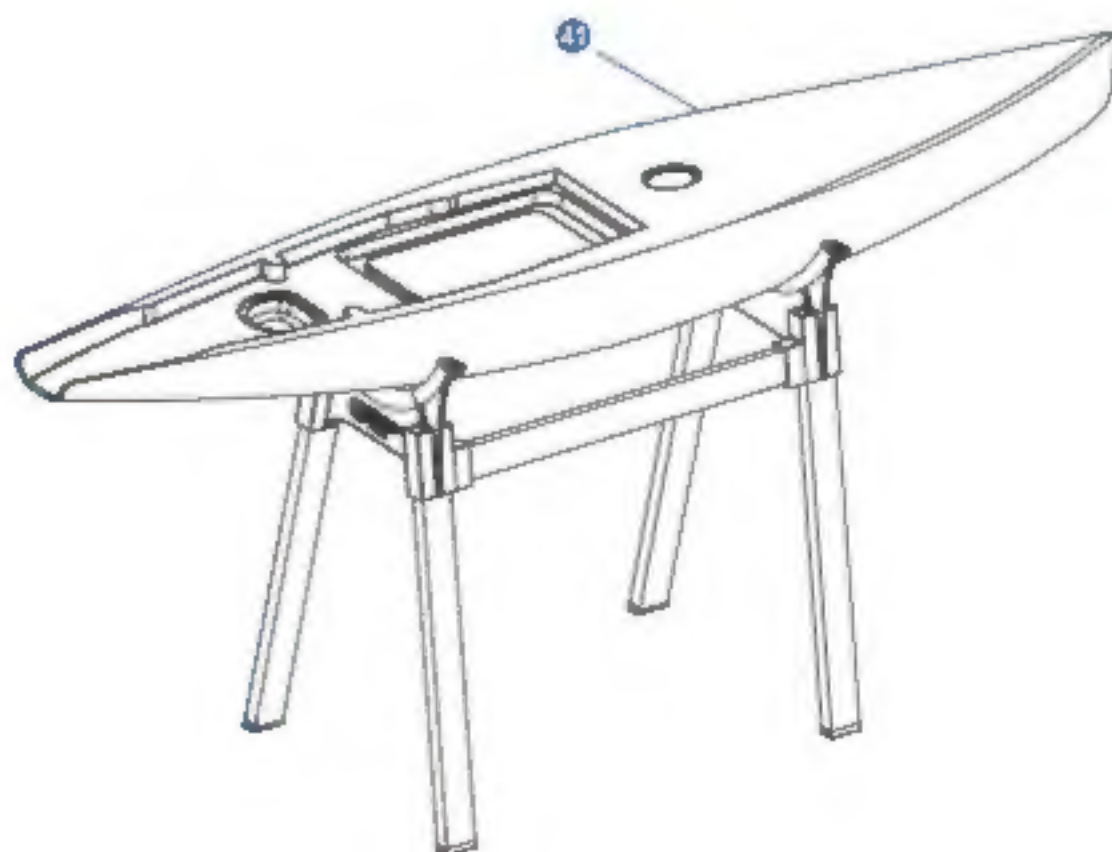
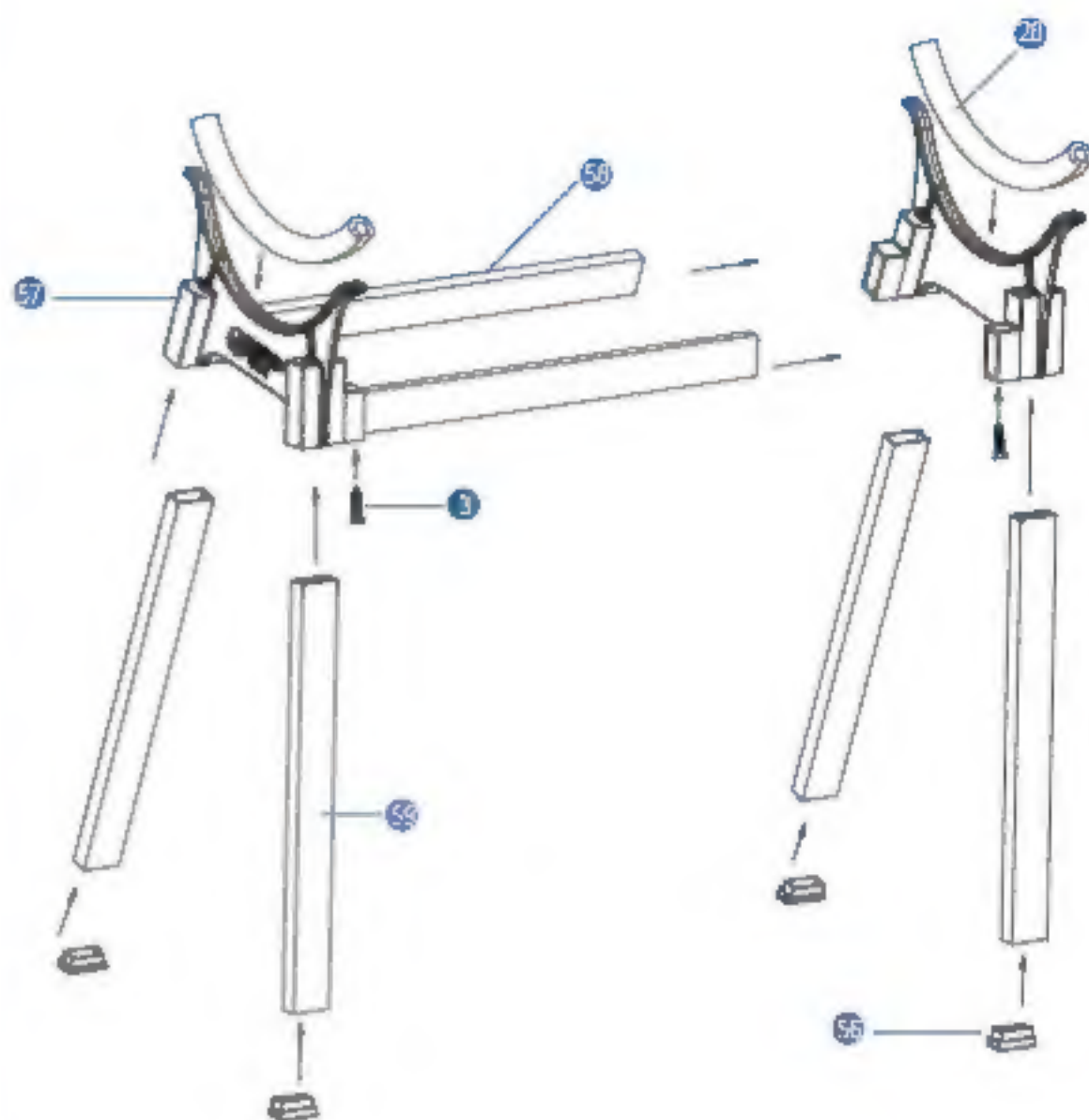


1

Display Stand Assembly

3 28 41 56 57 58 59

1. Locate the display stand parts, then assemble the stand as shown at right. Use 3x15mm wood screw **3** to secure the Hull Support **57** and Al. Stand B **58**. You may apply a thin bead of 5-min. epoxy at the joint before you insert the Al. Stand B.
2. Next Insert the other four Legs **59** and install the Feet **56**. It is not necessary to apply any epoxy for these four legs and feet.
3. Locate the black Foam Tube **28** then use scissors to cut the foam tube so it can be installed on the hull support as shown. This will protect the hull bottom from scratches during construction and storage.
4. Now you can place the Hull **41** on the display stand during construction.

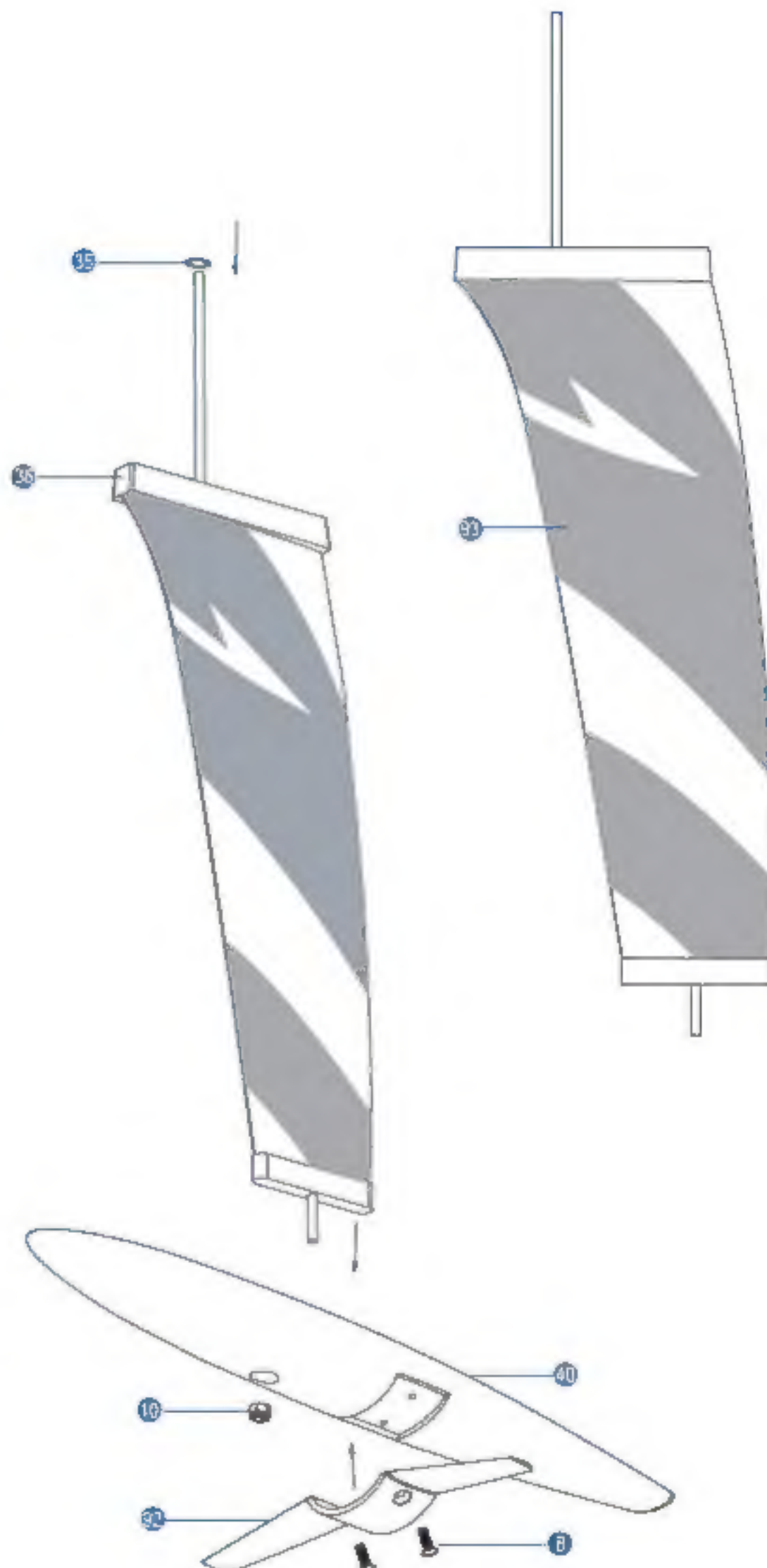


2

Keel Assembly

8 10 35 38 40 92 93

1. Refer to the illustration and apply the decal 93 on the Keel 38.
2. Thread the O-ring 35 onto the keel shaft.
3. Apply a generous amount of epoxy to the slot of Ballast Bulb 40 and insert the keel, securing with the M4 Locknut 10 by using the furnished small 4-way wrench. Wipe out the excess epoxy. Excess epoxy that over-flows the ballast bulb can be smoothed out with a wet finger, or removed using rubbing alcohol. This must be done before the epoxy hardens.
4. Secure the Stabilizer 92 with the two 3x8mm Sink Head Screws 8.

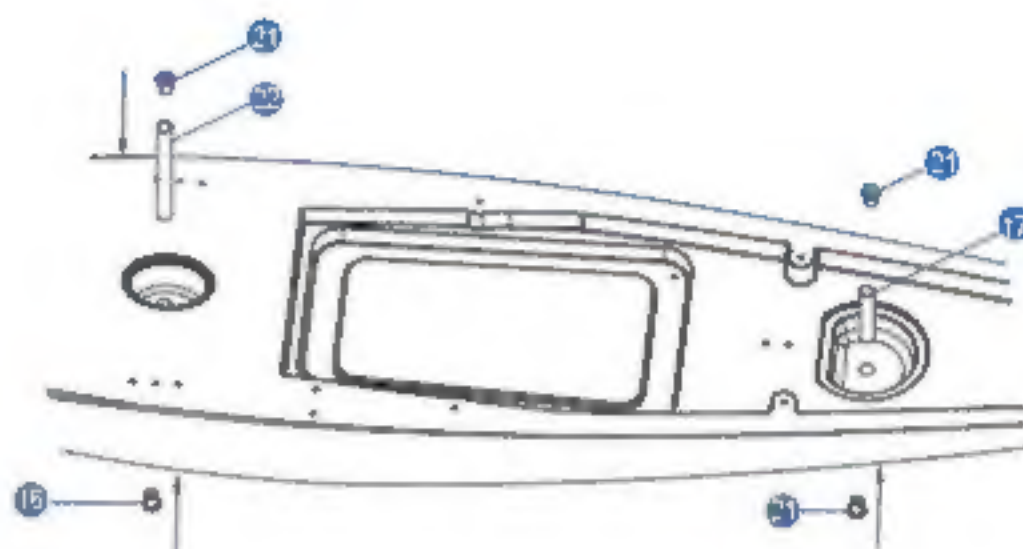


3

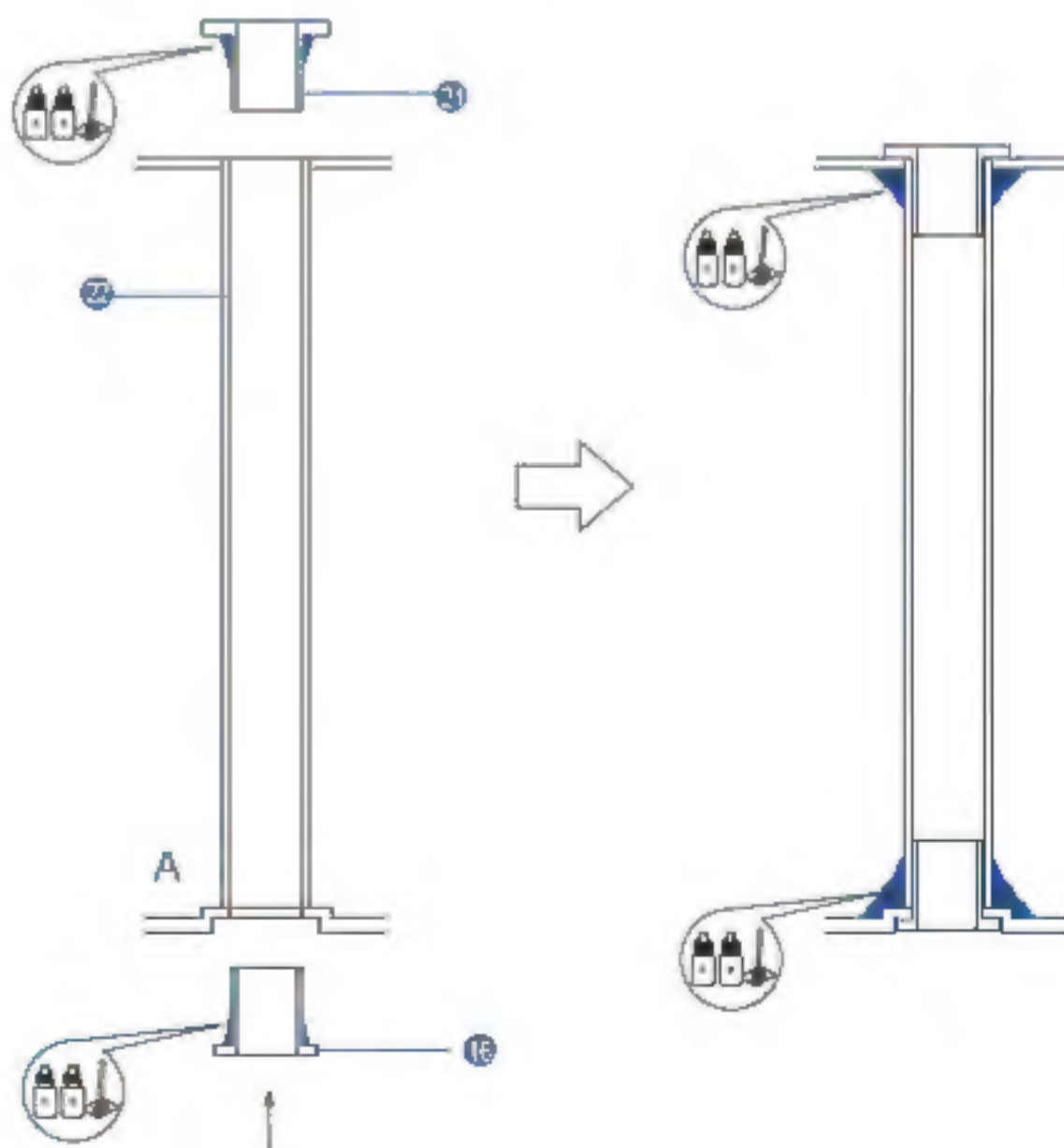
Keel and Rudder Tube Assembly

16 17 21 22

1. Insert the Keel Tube 22 from hull top and reach the hull bottom then epoxy the two End Caps 16 21 in place. There are three big end caps and one small end cap. The small one for the bottom hull. Note: end caps are working as waterproof and epoxy will help to fill the gap between cap and tube. However, do not leave any excess epoxy on the inside the tube as it will be difficult to insert the keel shaft if there is any hardened epoxy inside. Note: You may need to sand contact area A of the hull if tube is higher than the deck.



2. Using the same way to install Rudder Tube 17 and the other two end caps in place then allow the epoxy to cure.



4

Keel and Rudder Assembly

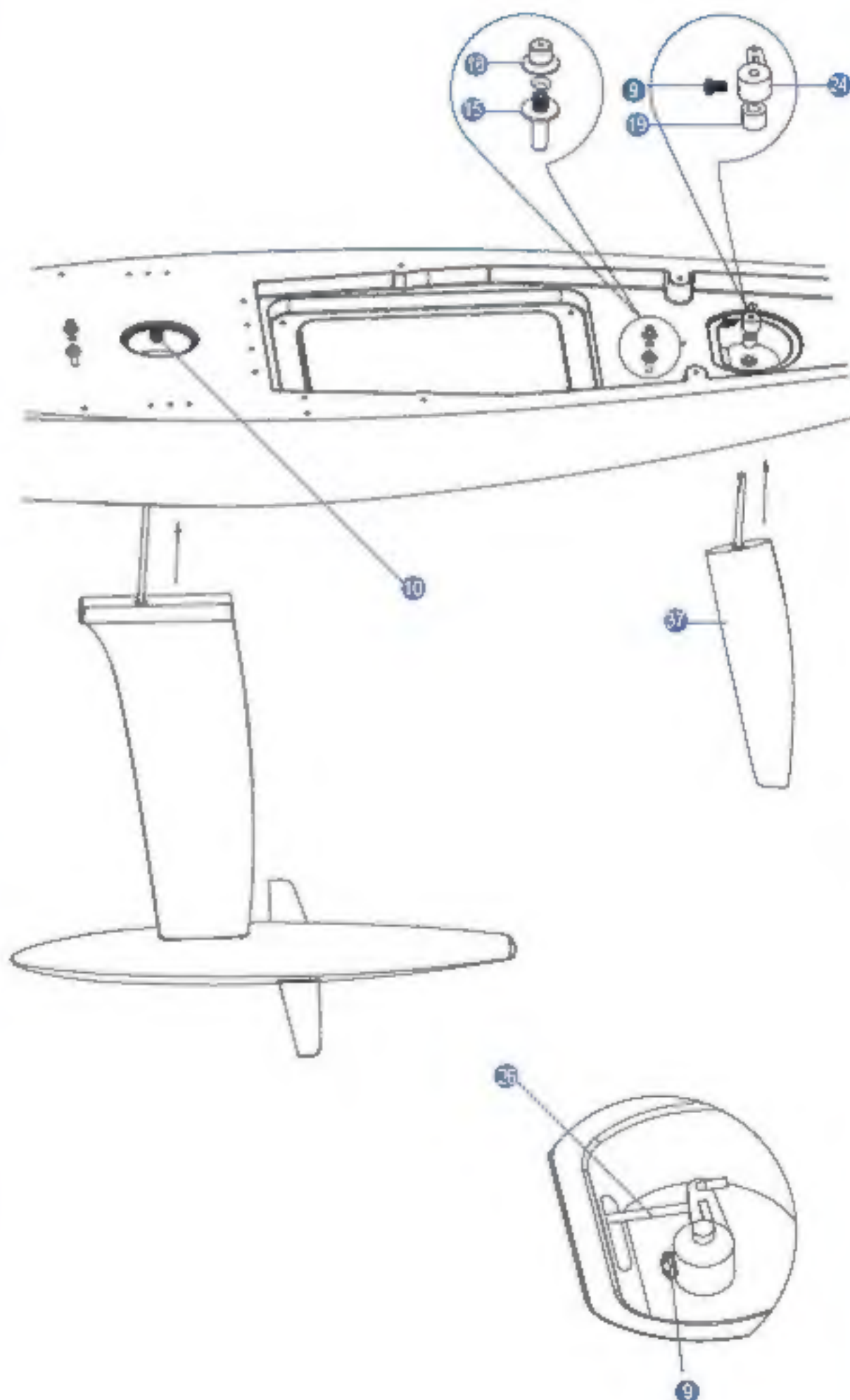
9 10 15 18 19 24 26 27

1. Drill 4mm hole at the dot then install the Winch Line Guide A 15 from the inside of the hull then secure Winch Line Guide A and B 18 together on the deck. Do the same procedure for the other winch line guide assembly.

2. Trial fit the keel in place, trim the contact area if necessary. Make sure the keel fit into the hull properly. Secure the keel shaft with M4 Locknut 10 by using the furnished 4 way wrench. The keel can make it inconvenient when moving the hull around during assembly.

3. Please use care when placing the hull on stand as the stabilizer will contact the A1. Stand B, it will need slightly to rotate the hull and let stabilizer go through the display stand.

4. Install Rudder 27 in place by securing the Steering Arm 24 and Collar 19 with 3x5mm Screw 9. In this step you will need to connect the Pushrod 26 by threading the Z-bend end to steering arm first then thread the other end to the hull so you can secure the arm with collar inside to the rudder shaft as illustration. Note: the pushrod and rudder should perpendicular to the steering arm.

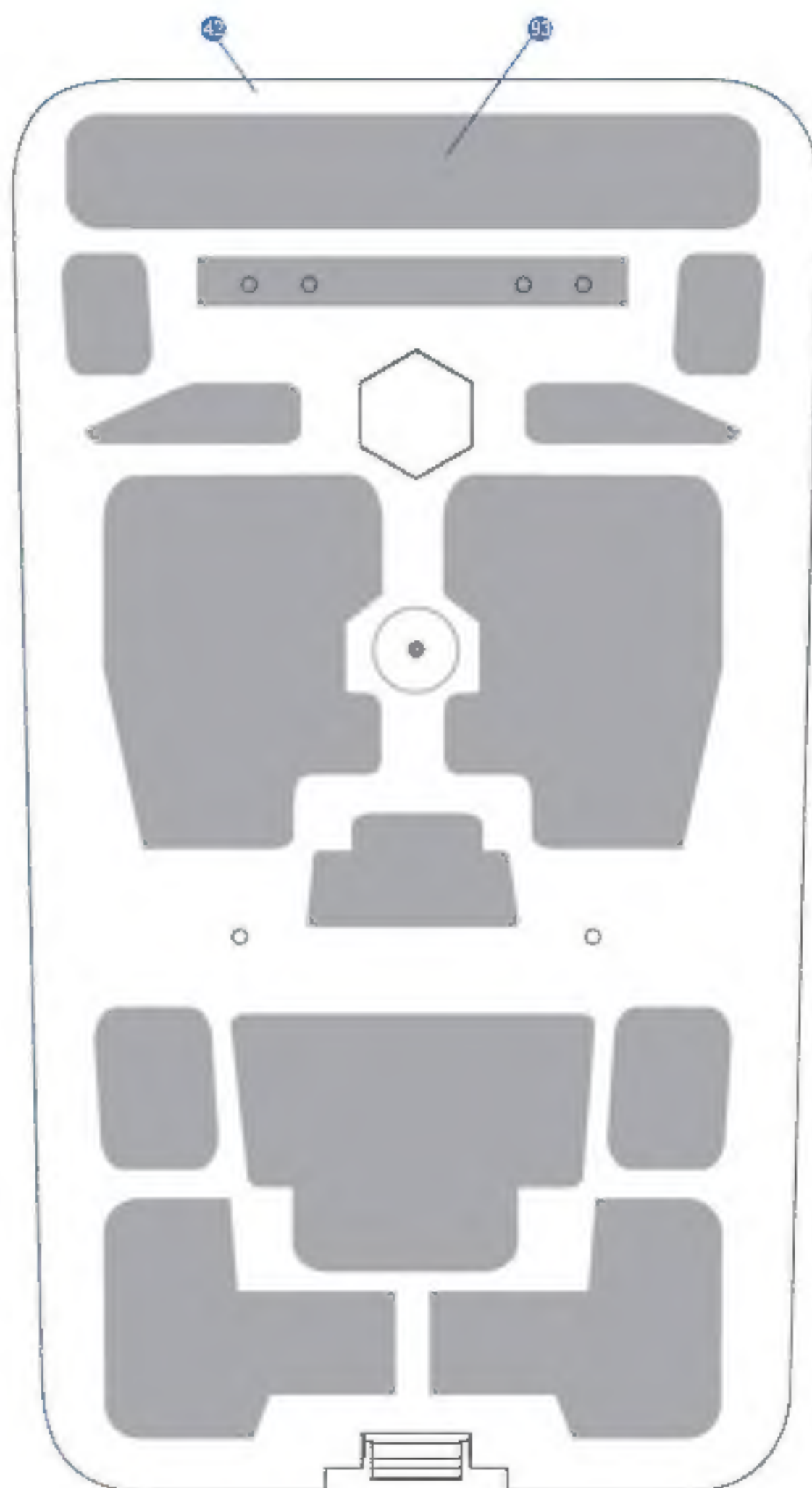


5

Hatch Cover Assembly

42 93

Trim the Decal 93 and apply on Hatch Cover 42 as shown



6

Hatch Cover Assembly II

4 5 25 66 67 68 77 81
84 85 86 87 88

1 Install the Silicone Tube 25 underneath the hatch cover as illustration. Start from steering wheel end then push in the silicone tube in place. Try to smoothen the tube as you can. Hint: Avoid of pulling or squeezing too much of the silicone tube. Also do not cut away silicone tube.

2 Install Steering Wheel 66 67 68 three parts together by using CA instant glue. Set it aside and wait final assembly.

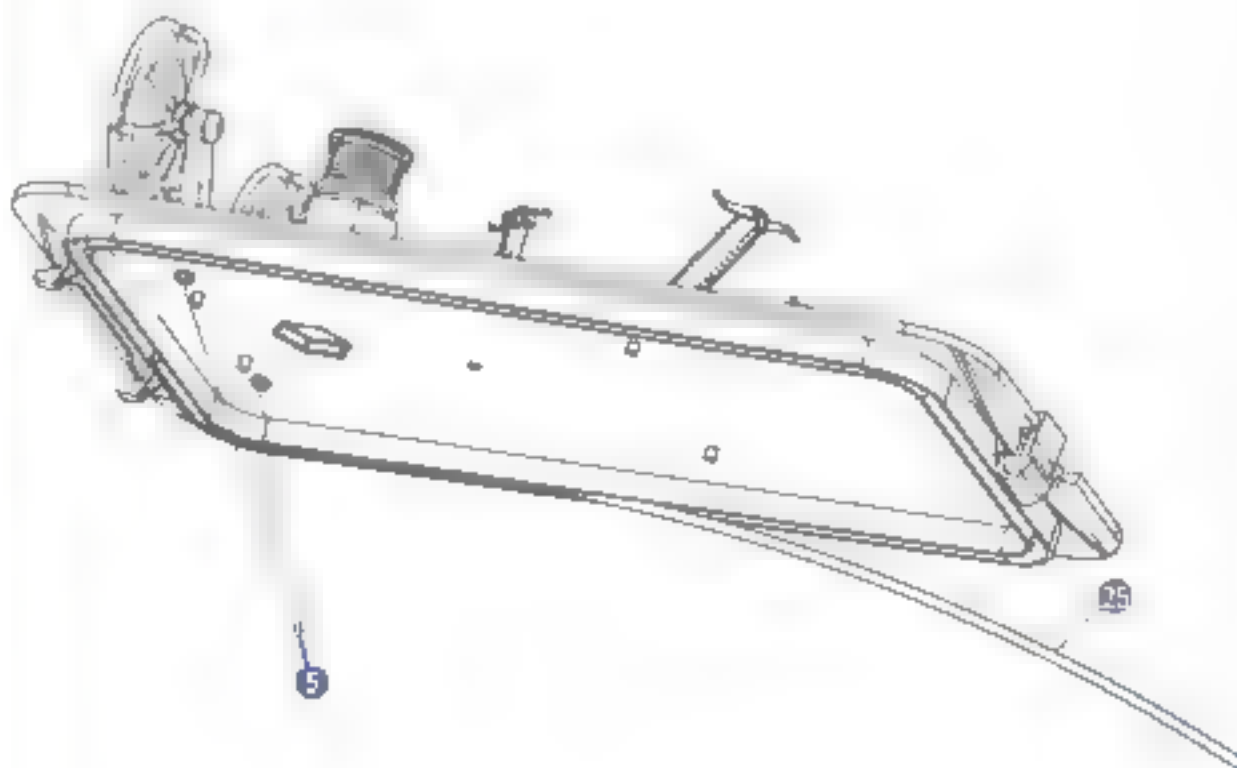
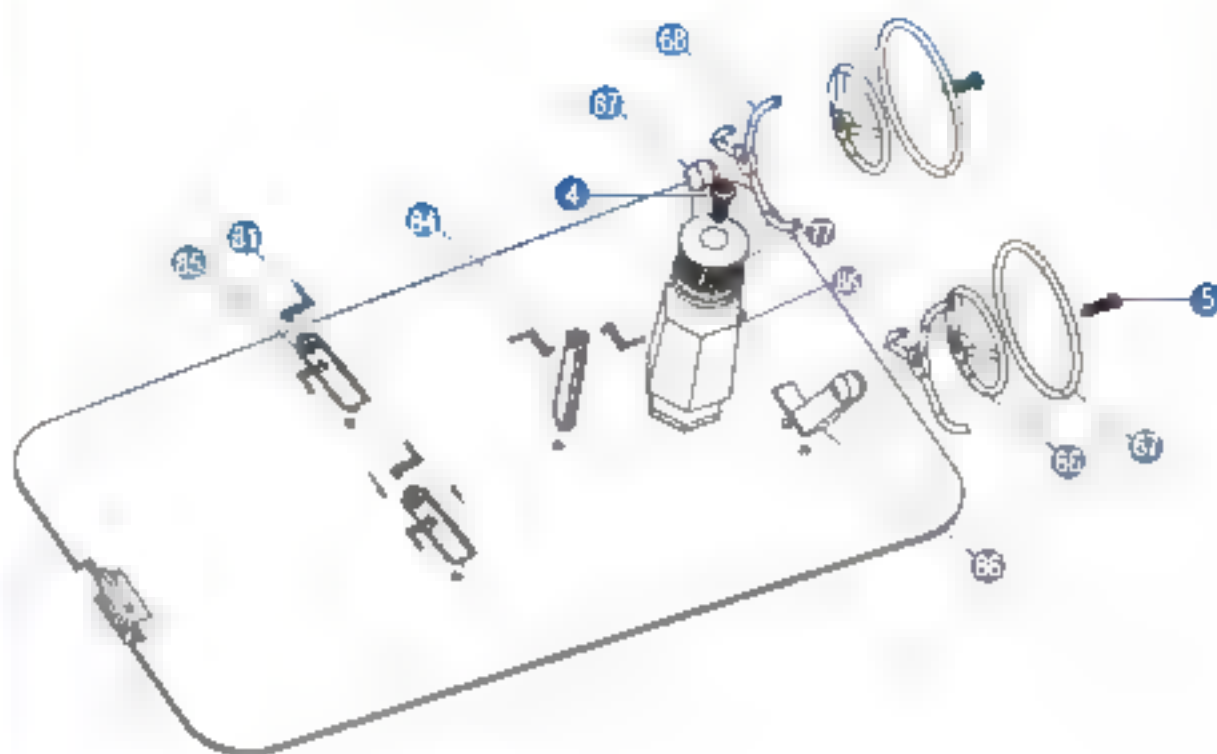
3 Glue Winch 66 Steering Wheel Stand 67 and Main Sheet Winch Stand 1 in place.

4 Secure the wheel stand with 3x10mm Wood Screw 4 next secure the Winch 66 on the Main Sheet Winch Stand.

5 Secure the steering wheel assembly on stand with 2x8mm Wood Screw 5.

6 Install the Winch Handle 77 in place. adjust the handle evenly then apply tiny CA at the joint.

7 After you done all adjustment and Ringing attach the hatch cover assembly in place.

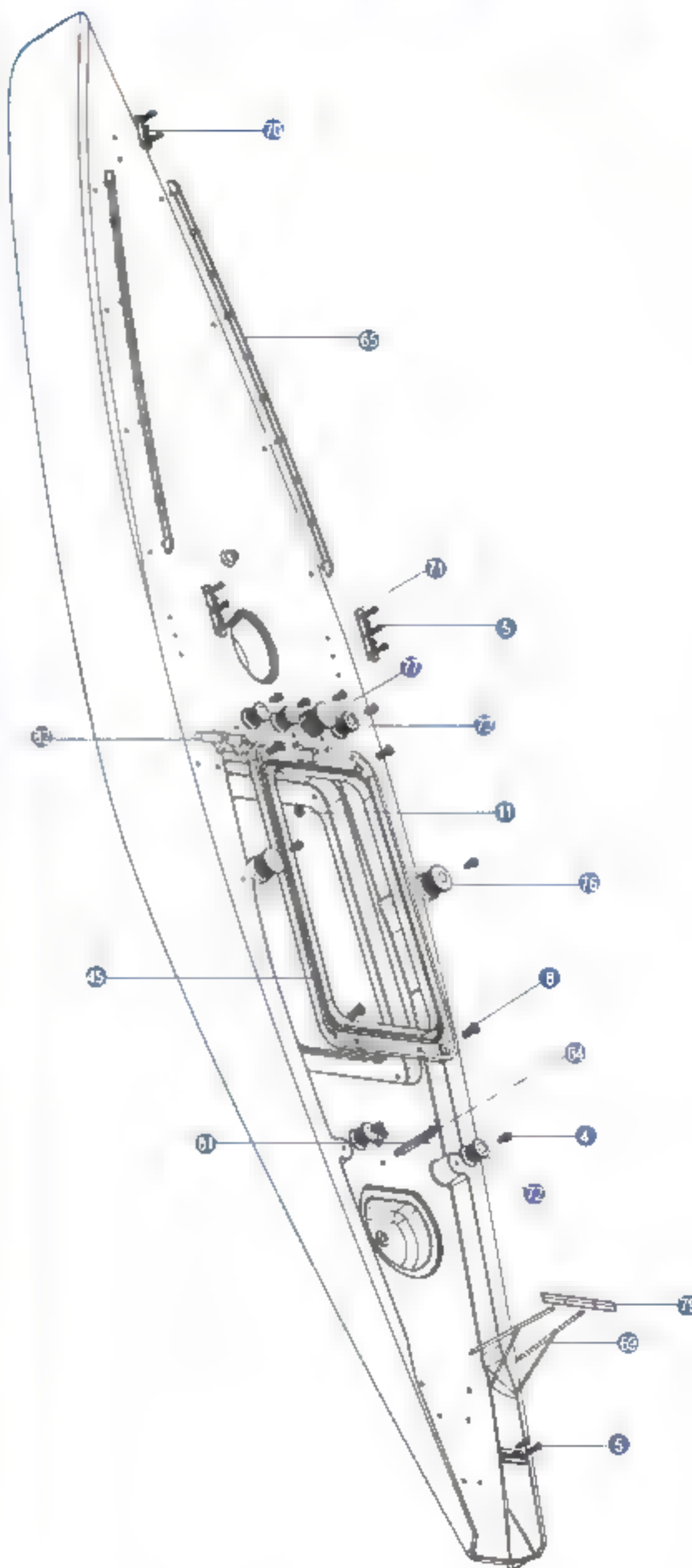


7

Hull Fittings Assembly

4 5 8 11 15 25 26 70
71 72 76 77 78 81 82 84

- 1 Drill four 3mm(1/8") hole at the dots around the hull opening
Next secure the Hatch Cover Mount (25) with 3x8mm Sink Head Screw (4) and M3 Locknut (11)
- 2 Install all Winches (76, 77, 78) as shown you will need to drill 2mm(5/64") hole at the dot and secure the winches with 3x10mm Wood Screws (5)
- 3 Drill 1 6mm(1/16") hole at each dot for Chain Plates (71, 72), secure the chain plates with 2x8mm Wood Screws (8)
- 4 Drill 1 6mm(1/16") holes for Winch (81), CA the winch in place next glue the handles (82)
- 5 Drill 1 6mm(1/16") holes for Aerial Frame (79, 80) install the Aerial Frame in place as shown.
- F Drill 2mm(5/64") hole at each dot for Rail (65), trial fit the rail then apply CA glue to secure the rail in place
- G Drill 2mm(5/64") hole for the decoration (70) CA this part firmly on deck

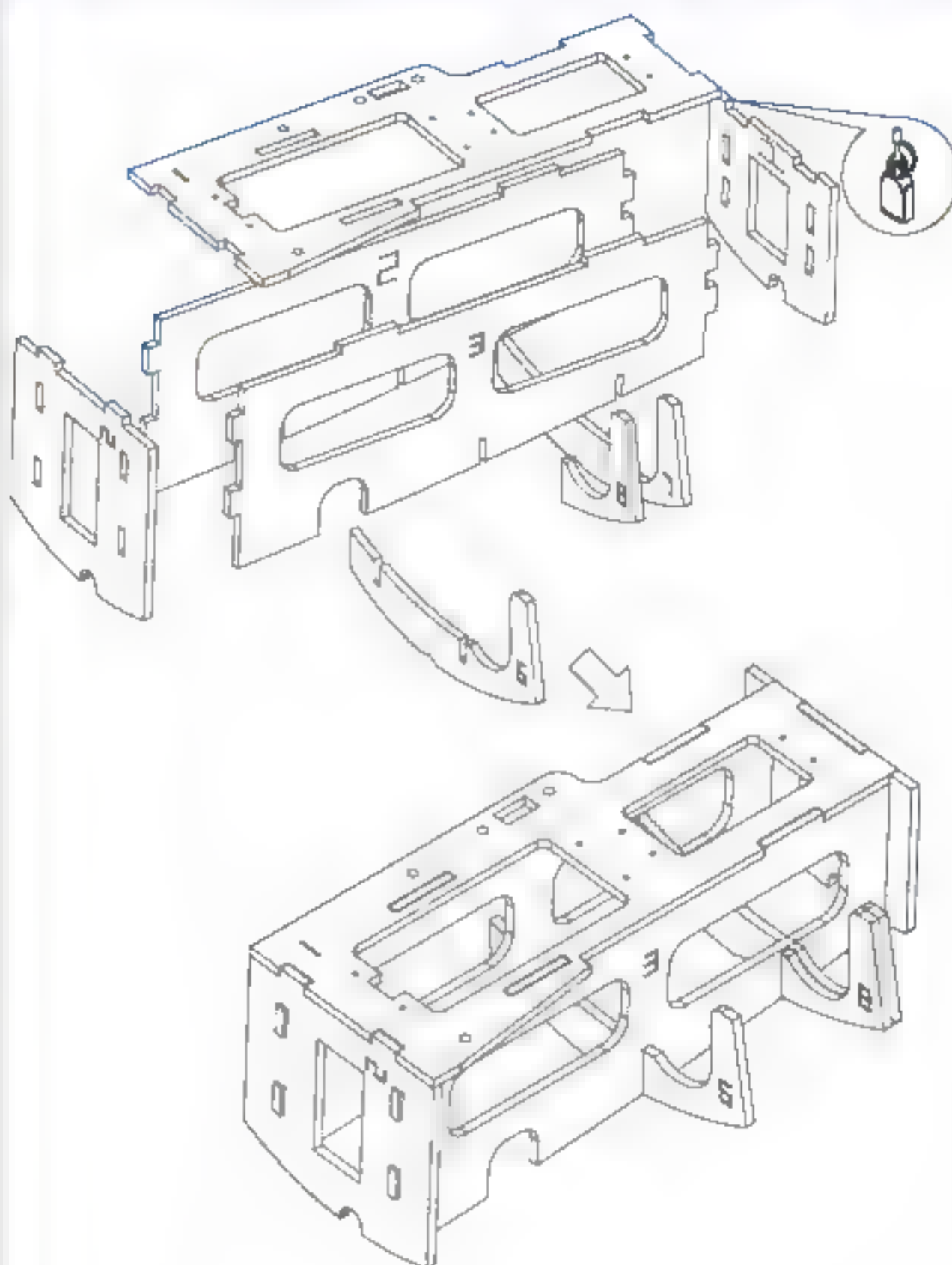


8

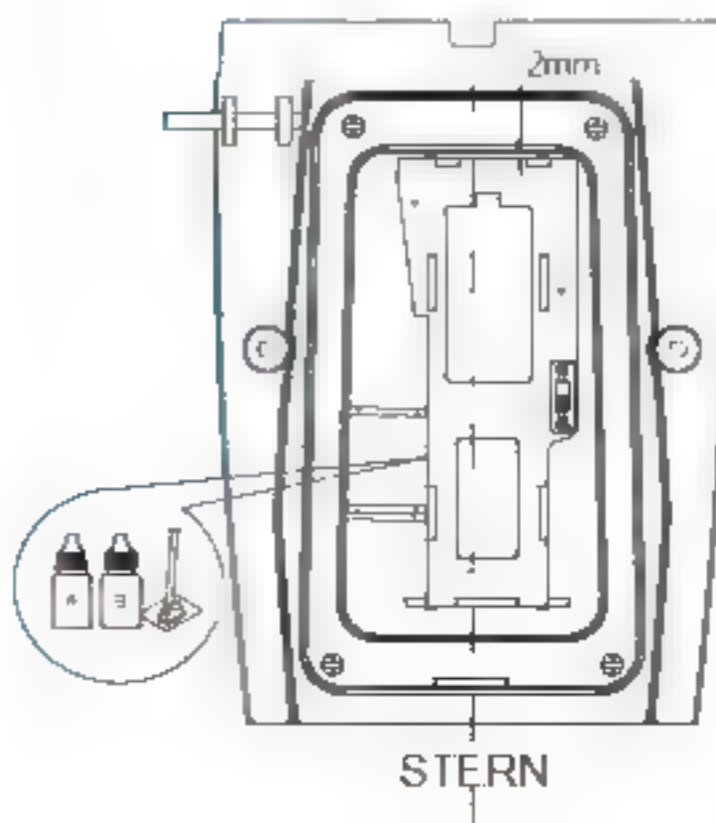
Servo Tray Assembly



1. Locate the die-cut plywood sheet ③ then use thick CA to assemble the servo tray as shown
2. Slightly sand the glue area inside the hull then apply enough epoxy to glue servo tray in the hull. Note the position will be about 2mm (5/64") from the edge to the hatch opening if you see from the top vertically. Suggest to use sandpaper to sand the glue area, this will enhance the adhesion.



BOW



STERN

9

Main Mast Assembly

1 5 7 10 12 14 16 18
 45 47 49 51 53 55 57 59
 64 70 72 74 80 91

1 Secure the two Ends ① onto the Main Boom ④ with 2x8mm wood screw ⑤

2 Secure the Chain Plate ⑩ on the main boom with 2x8mm wood screw ⑤

3 Secure the Ball ⑫ on the boom with 2x12mm Screw ⑦

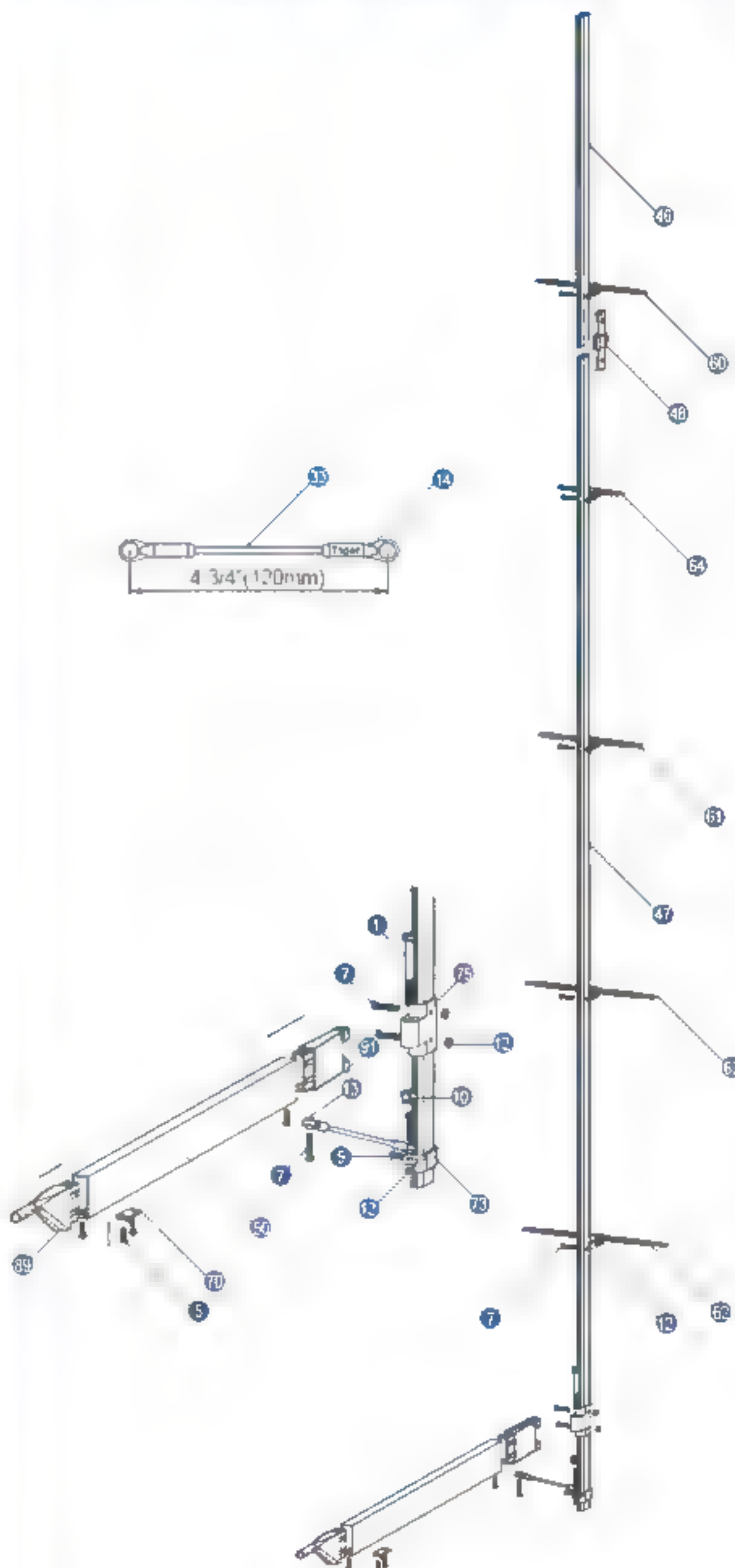
4 Assemble Main Mast A ⑬ and B ⑭ with the Mast Joiner ⑮ and Boom Joiner ⑯. Secure the boom joiner with 2x12mm Screw ⑦ and M2 Nut ⑫

5 Install all Spreaders ② ③ ⑥ ⑧ ⑨ in place as illustration with 2x12mm Screw ⑦ and M2 Nut ⑫. Do not over-tighten the nut as it may damage the mast.

6 Install the ball on Tie Rod Base ⑰ with 2x12mm Screw ⑦ and M2 Nut ⑫. Next secure the base at the bottom of main mast with 2x8mm Wood Screw ⑤

7 Install the main boom on the boom joiner with 4x32mm Screw ① and M4 Nut ⑩. Keep the main boom rotates freely

8 Assemble the Tie Rod ⑱ with two Ball Ends ⑲ as illustration. Note the "Tiger" marks are either way at two ends. The "Tiger" mark always faces up when pushing the ball end to the ball.



10

Main Sail Attachment

6 30 31 32 49 53 54 78

1. Install the Head Crane 49 as illustration with Wire Base 78 and Sail Wire 32. Tread the sail wire to the base about 5mm (13/64").

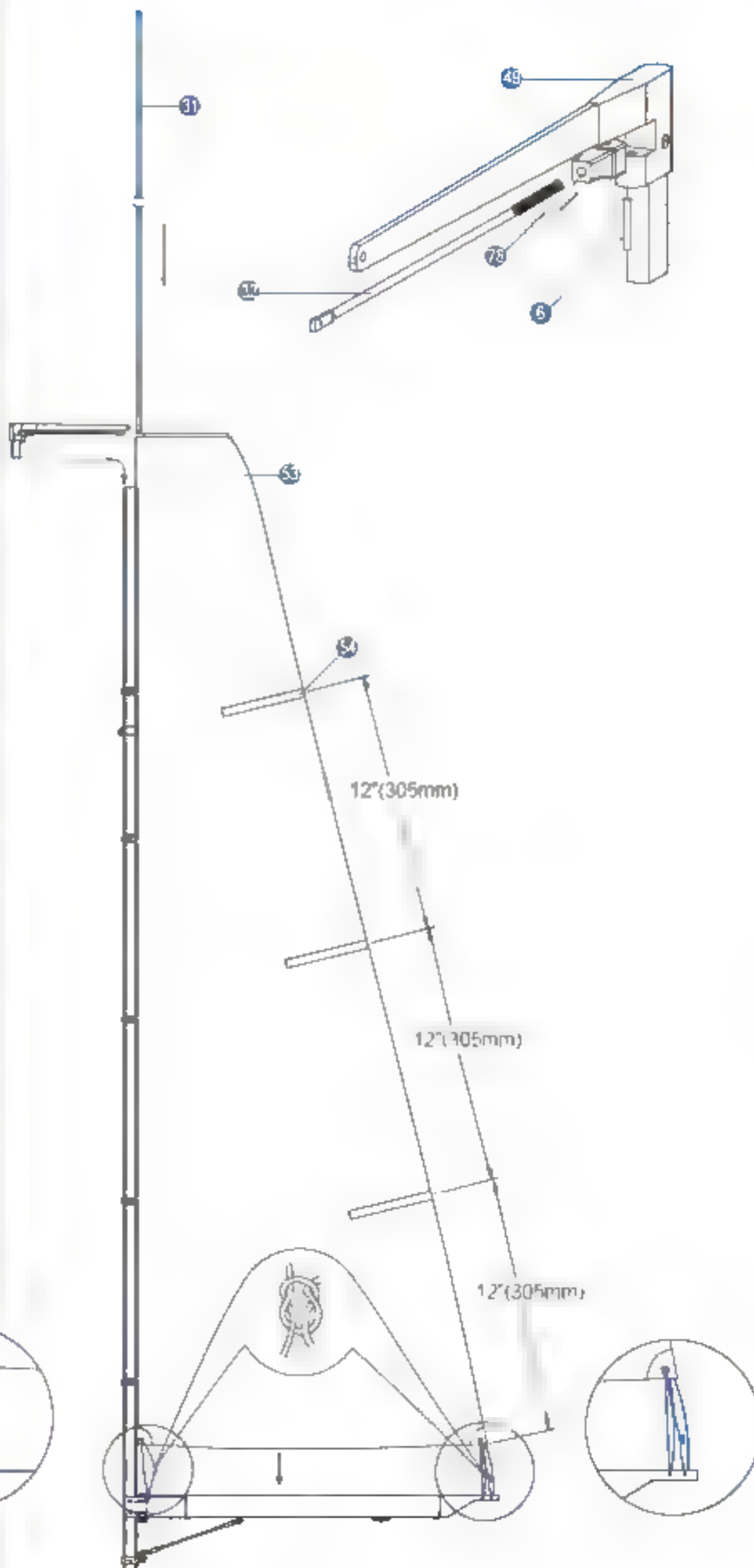
2. With wire base in place, press the 2X14mm Pin 6 into the hole. Make sure the wire base can rotate but not freely.

3. Apply PVC Strip 32 on the Sail 53 in the position as illustration. Note: Apply at the back side is suggested. These Strip will reinforce the sheet.

4. Thread the PE String 31 in the sheet next side the leading edge of main sail into top groove of the mast.

5. You will need to install the head crane at the same time when pulling the sail all the way to the root of the mast. Thread the wire into the top of the sail then install the head crane in place when sail is pulling to the root. Make sure that at the leading edge of sail is smooth and securely in the groove of mast.

6. Now you may be the sail with the Black String 54 on the boom. Reef knot is Suggested.



11

Main Sail Rigging





1 Cut 7 pieces Rigging Strings into the lengths as shown for use in this step

Jump String A x 1	48" (120cm)
Jump String B x 2	36" (95cm)
Mast String C x 2	52" (130cm)
Mast String D x 2	6" (10cm)

2 Jump String A

Thread the jumper string A from the second spreader root through the first spreader tip, head crane, the first spreader tip and finally back to the second spreader root. Try to adjust the string as tight as possible and make both two Figure Eight knots at the second spreader root.

3 Jump String B

Make a Figure Eight knot then thread Jump String B from second spreader tip to the other side of the third spreader tip, the other side of fourth spreader tip then the other side of the fifth spreader tip. Adjust the tension and make the same knot. Do the same procedure for the other Jump String B.

4 Mast String C

Make a Figure Eight knot then thread Mast Rigging String C from the first spreader root through the second spreader tip, the third, the fourth and the fifth spreader tip.

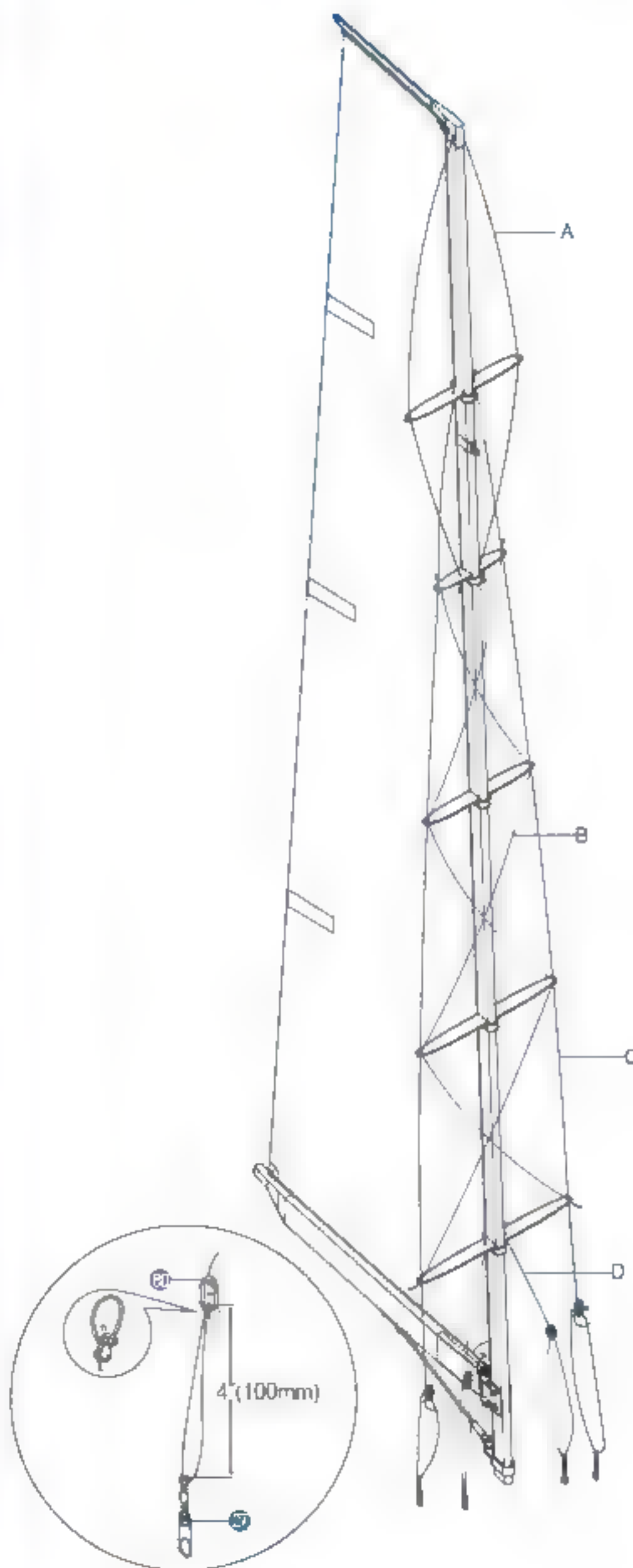
Thread the string through the first hole of String Adjuster, then the second hole. Next thread through the Swivel, then the third hole. Make a Bowline knot. Keep adjuster is about 10cm to the swivel.

Do the same procedure on the other Mast Rigging String C.

5 Mast String D

Make a Figure Eight knot then thread Mast Rigging String D from the fifth spreader root then do the same way on the string adjuster and swivel.

Do the same procedure on the other Mast String D.



13



Jib Sail Attachment

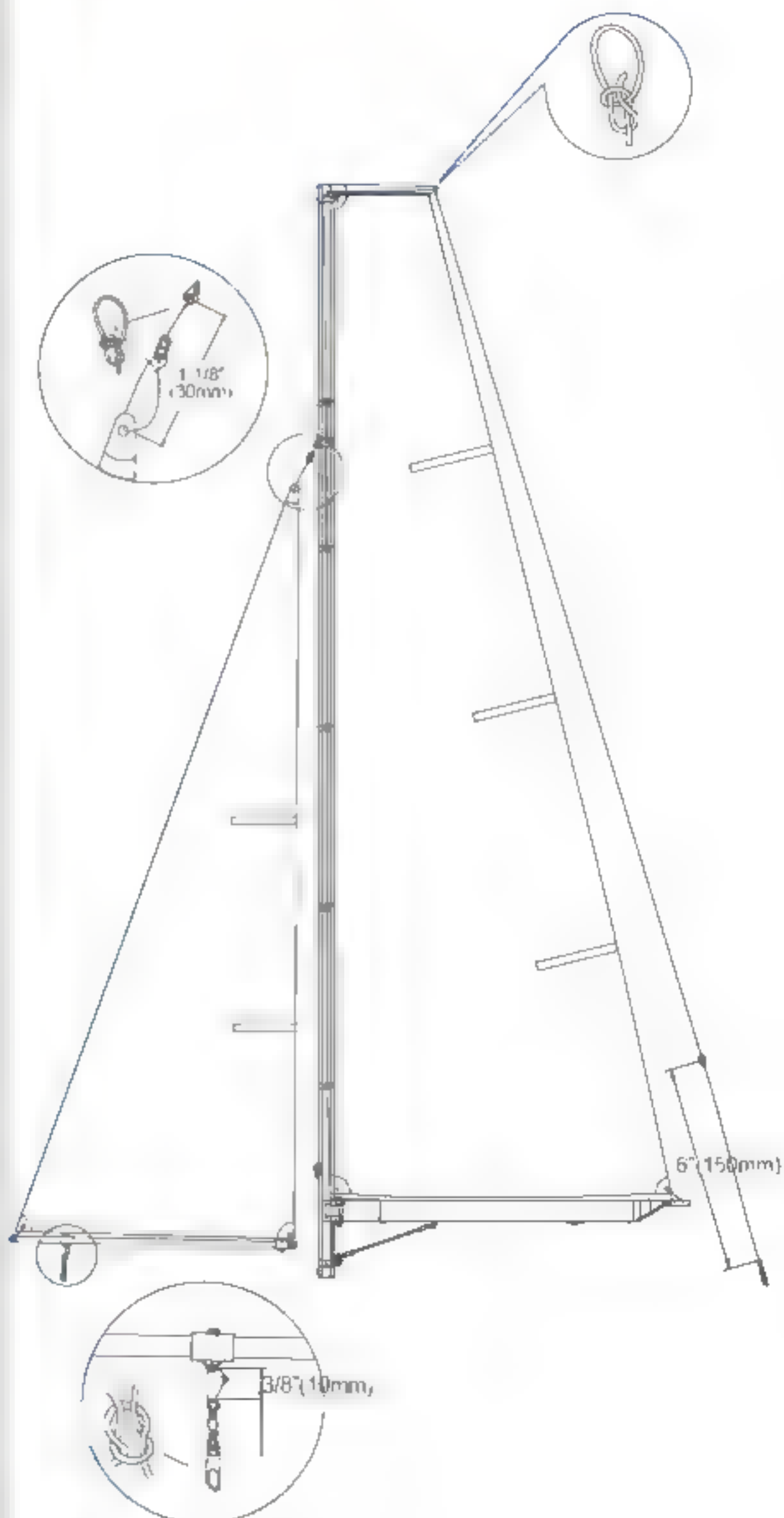
27 30 60

1. Tie a Swivel  at the jib boom control slider with Black String  as illustration.

2. Cut a piece of string in length of 10" (25cm) then secure the jib sail on Mast Joiner as shown.

3. Backstay String

Cut a piece of string in length of 63" (160cm) then make a Bowline knot at the head crane tip. Do the same way as mast rigging line to thread string to Adjuster  and Swive .



14

Radio Installation I



- 1 First cut two sail control lines

Main Sail Control Line 39"(100cm)
Jib Sail Control Line 39"(100cm)

- 2 Thread the control lines through front and rear winch line guides then try to reach the line inside the hull. Temporarily secure the two ends on the deck and servo tray with tape to prevent the line loosened

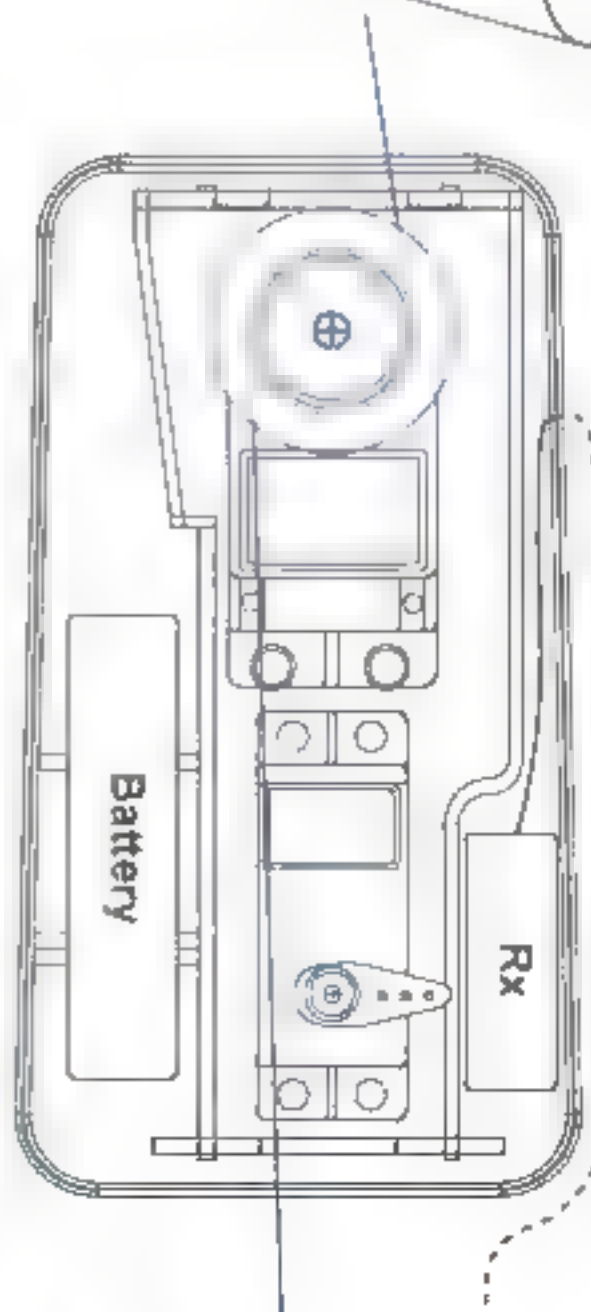
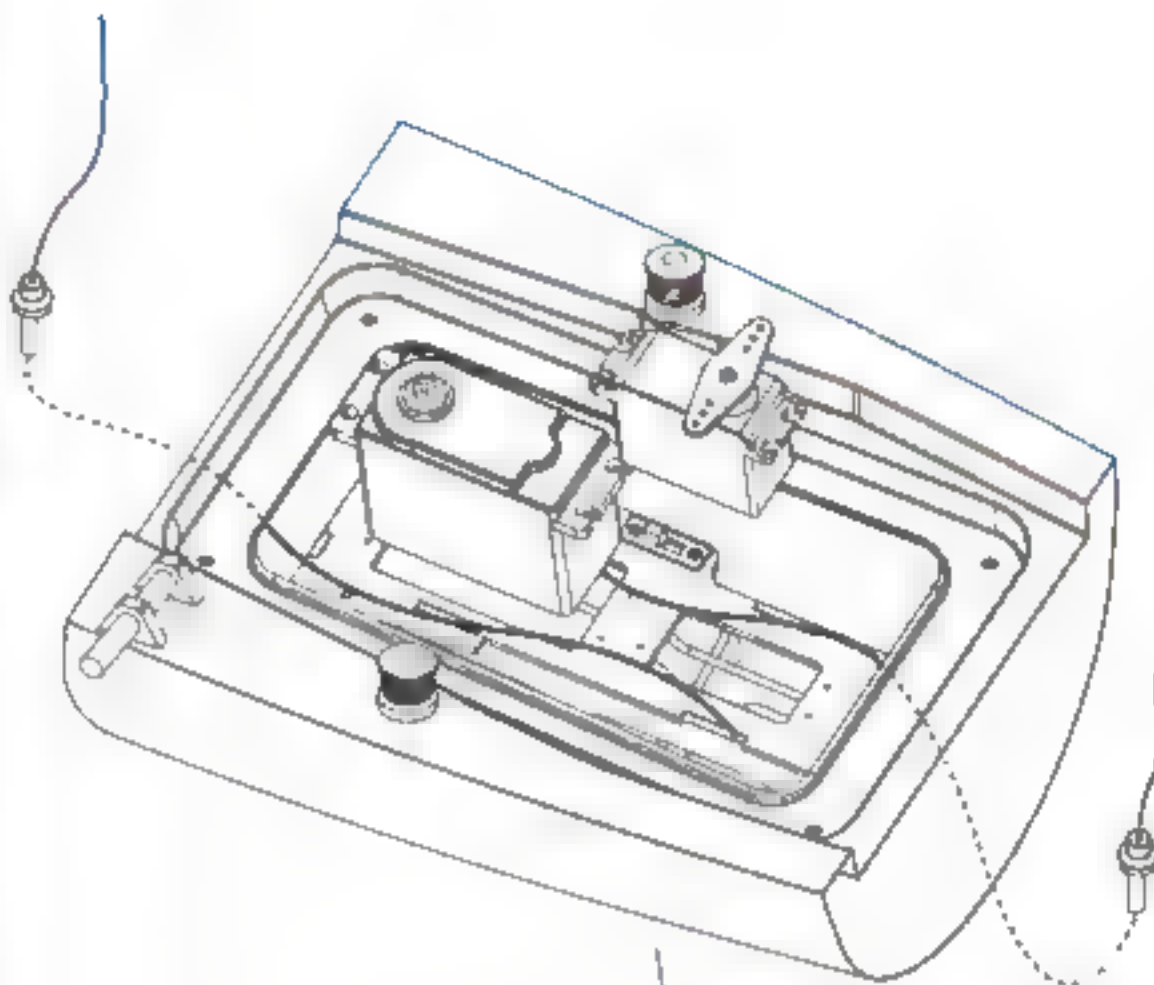
- 3 Refer to servo manual and install the servo mounting hardware then secure the servos in place. Note the servo orientation

- 4 Install the switch in place

- 5 Connect the radio system following the manufacturer instructions. Place the receiver in the radio compartment at the right side of servo tray

- 6 The Sub-C 4-cell 3000~4000mAh battery is recommended (No 2980) which you can place in battery holder

- 7 Tape the receiver antenna wire to underside of the deck then thread the antenna to the rudder steering well



15

Radio Installation II

2 20 23 27 34 39 43 44 93

1 Thread a Metal Clevis **20** on the pushrod. Attach the clevis to the servo arm. Adjust the clevis so that the servo arm and rudder steering arm are at ninety-degree angle to the pushrod when servo is in neutral position. Attach the rudder cover decal **23** on the rudder cover **20** then drill $5/64$ 12mm hole for antenna to go through. Thread antenna and attach the cover in place.

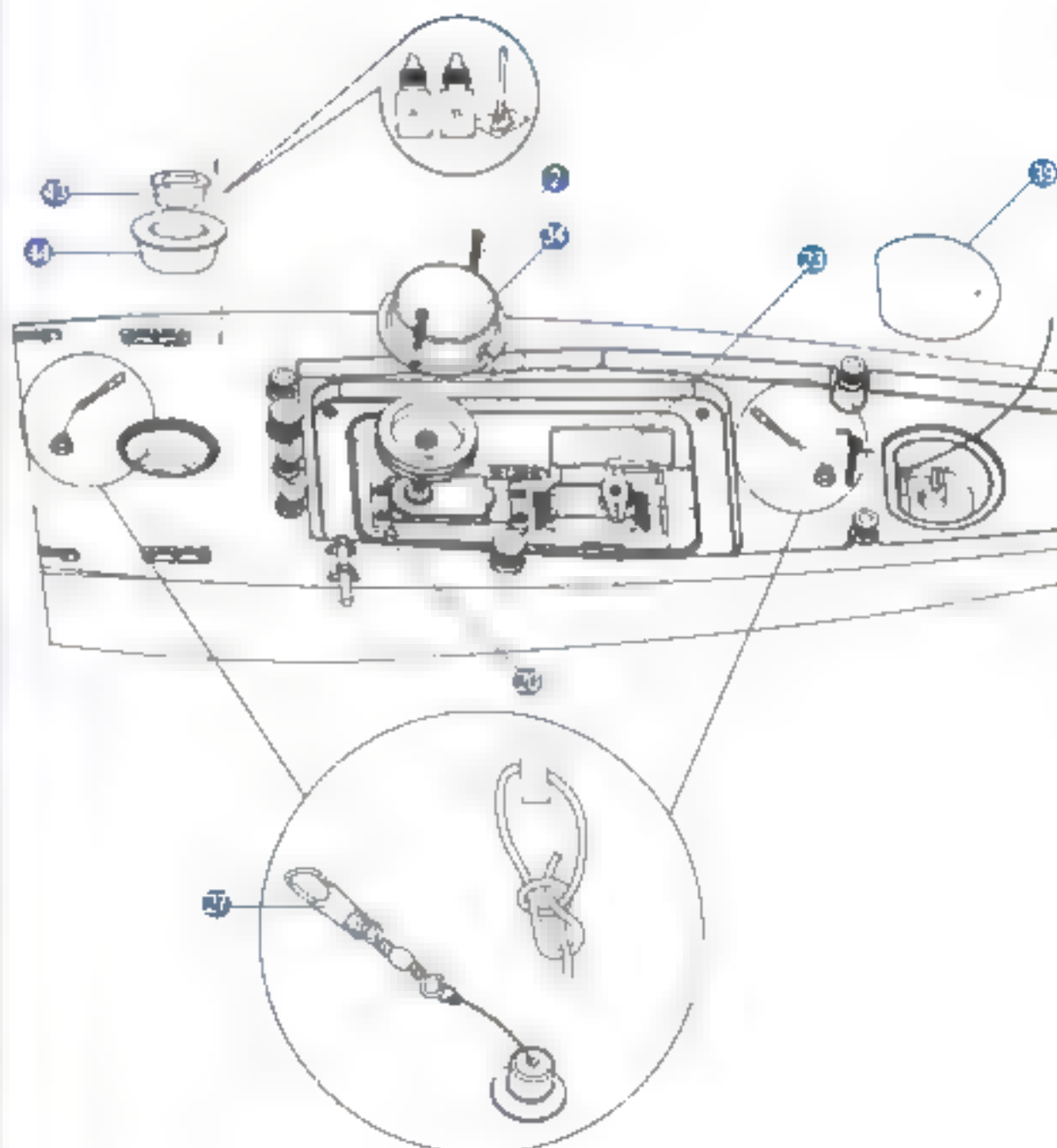
2 Epoxy the Mast Mount A **43** B **44** in place. Make sure there is no epoxy inside the mast mount A as the Mast will install in later. Epoxy the keel in bottom slot and whole mast mount is recommended if user would enhance the performance however the weakness is the keel can not be removed.

3 Thread one end of the Jib Sail Control String to the servo drum. Make a Figure Eight knot in the drum. Turn on the radio and make sure the control stick is full down then wind the string for two turns in the drum then place the drum on the winch servo.

4 Tie a Bowline knot to the Swivel **27** on the other end of the control string. Keep the string about $1/8"$ 3mm out of the front winch line guide. Note: The less turns of string in the drum the less chance for string to be out of the groove.

5 Do the same procedure on the Main Sail Control String but keep the string about $1.5"$ 40mm, out of the rear winch line guide.

6 Do the sail adjustment in page 21 after you satisfied with the adjustment then secure the drum with the screw comes with the servo. Next secure the Winch Servo Cover **43** with two Standoff **44** and 3x25mm Wood Screw **2**. You will need to trim a notch for the string to go.

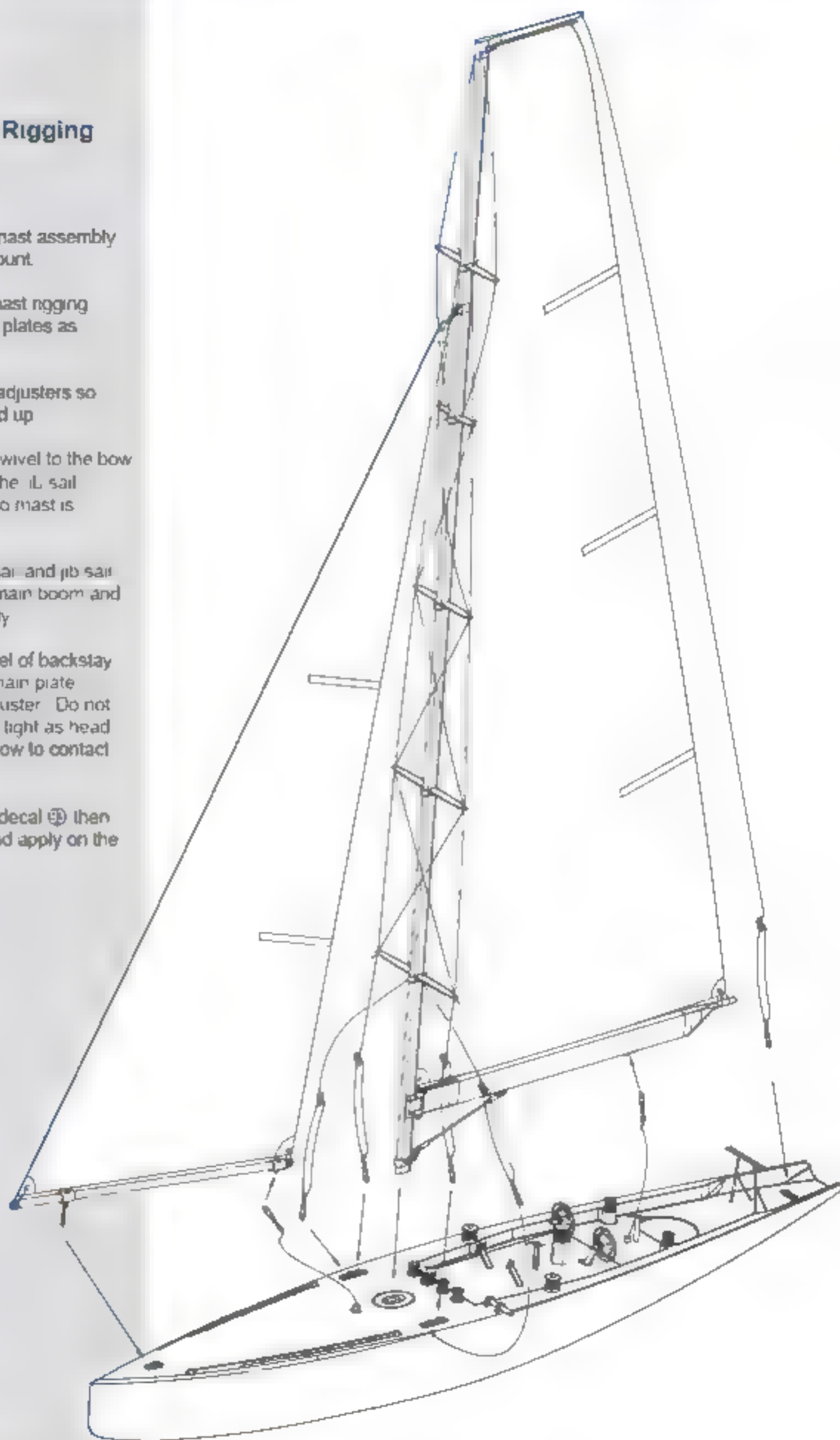


16

Attaching the Rigging Snaps

Ⓢ

- 1 Attach the main mast assembly to the main mast mount.
- 2 Snap on all the mast rigging swivels to the chain plates as shown.
3. Adjust the string adjusters so main mast can stand up
- 4 Attach jib boom swivel to the bow chain plate. Adjust the jib sail adjuster at the top so mast is vertical
- 5 Attach the main sail and jib sail control lines to the main boom and jib boom respectively
6. Snap on the swivel of backstay string to the stern chain plate. Adjust the string adjuster. Do not adjust the string too tight as head crane might be too low to contact the sail
- 7 Trim the number decal Ⓢ then refer to color box and apply on the sheet



17

Adjustment

1 Sail Adjustment

A. When the sail winch transmitter control stick is in the full "down" position, the sail winch servo drum should rotate and the sail control lines are tight. Jib sail and main sail now are at about 0-degree. If not, you may adjust the string length.

B. With winch drum is in the "full up" position, open the main boom to a deflection of about 80-degree.

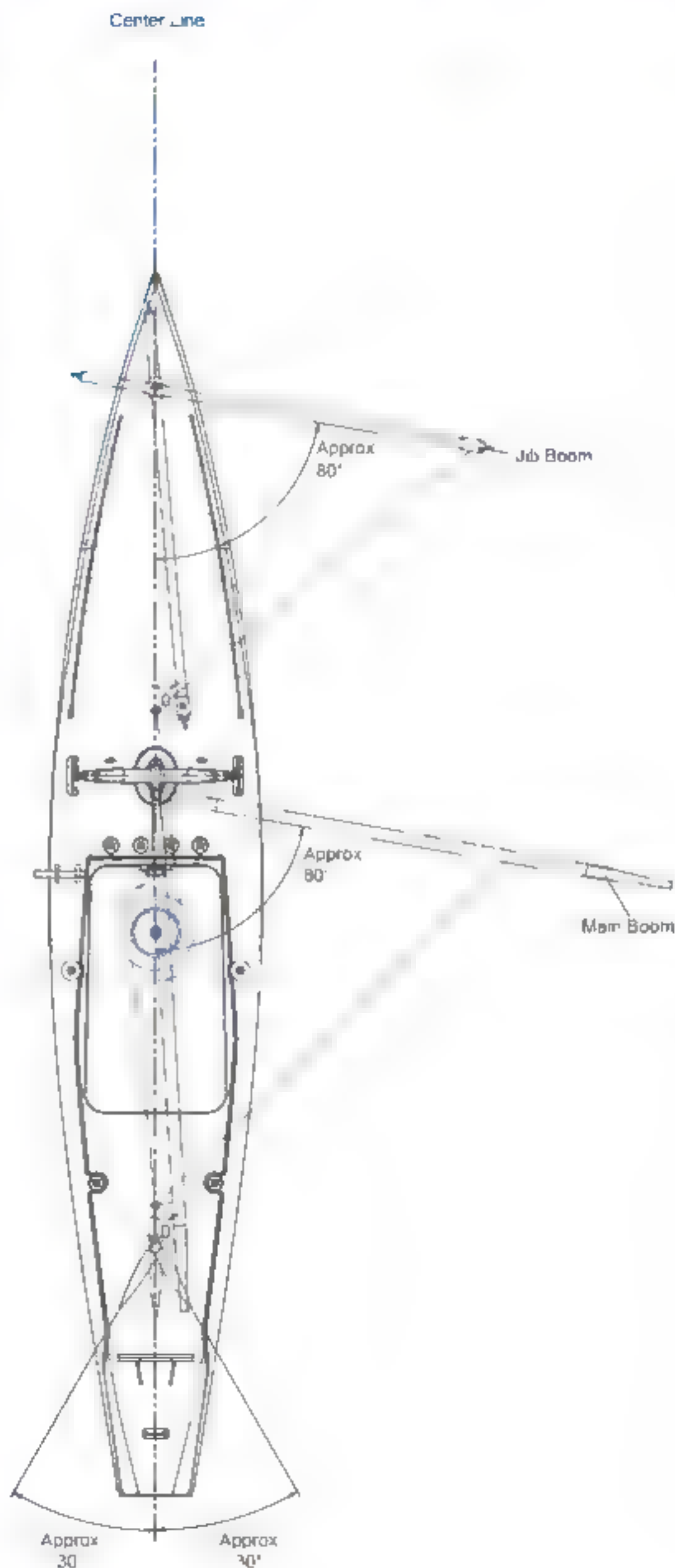
C. It will be necessary to readjust the "full down" setting again, as both of these adjustments are effected by one another. The goal is to reach the best compromise possible.

D. Normally use the trim on transmitter will help the adjustment. If use a quality radio which has end position adjustment function, then it will be much easier to adjust sail angle.

E. If user use other servo, then the control throw might vary. In this situation, user will have to change the position of the Chain Plate on Main Boom and the Slider on Jib Boom. Drill 1/16" holes at the desired position, then use furnished 2x8mm wood screw to secure the slider and the chain plate.

2 Rudder Adjustment

Make sure that the rudder deflects 30-degree in each direction. If it does not, move the clevis closer to the center of the servo arm.



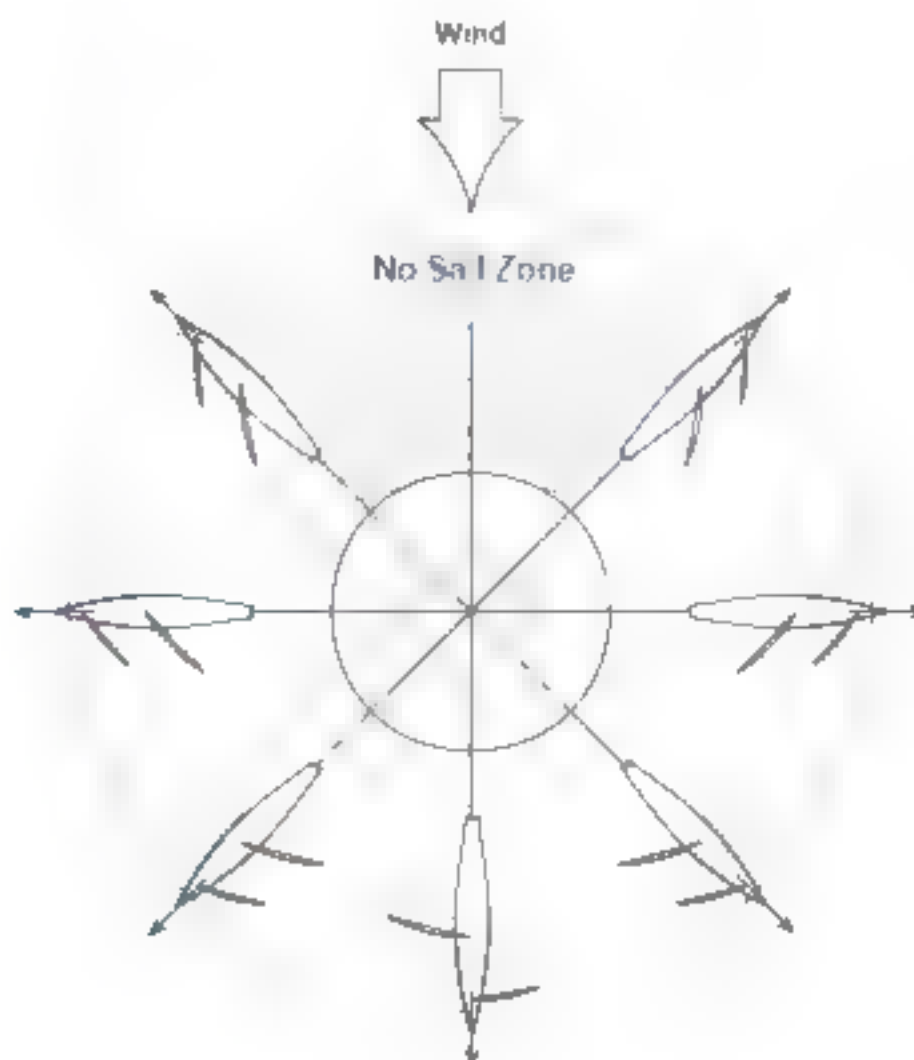
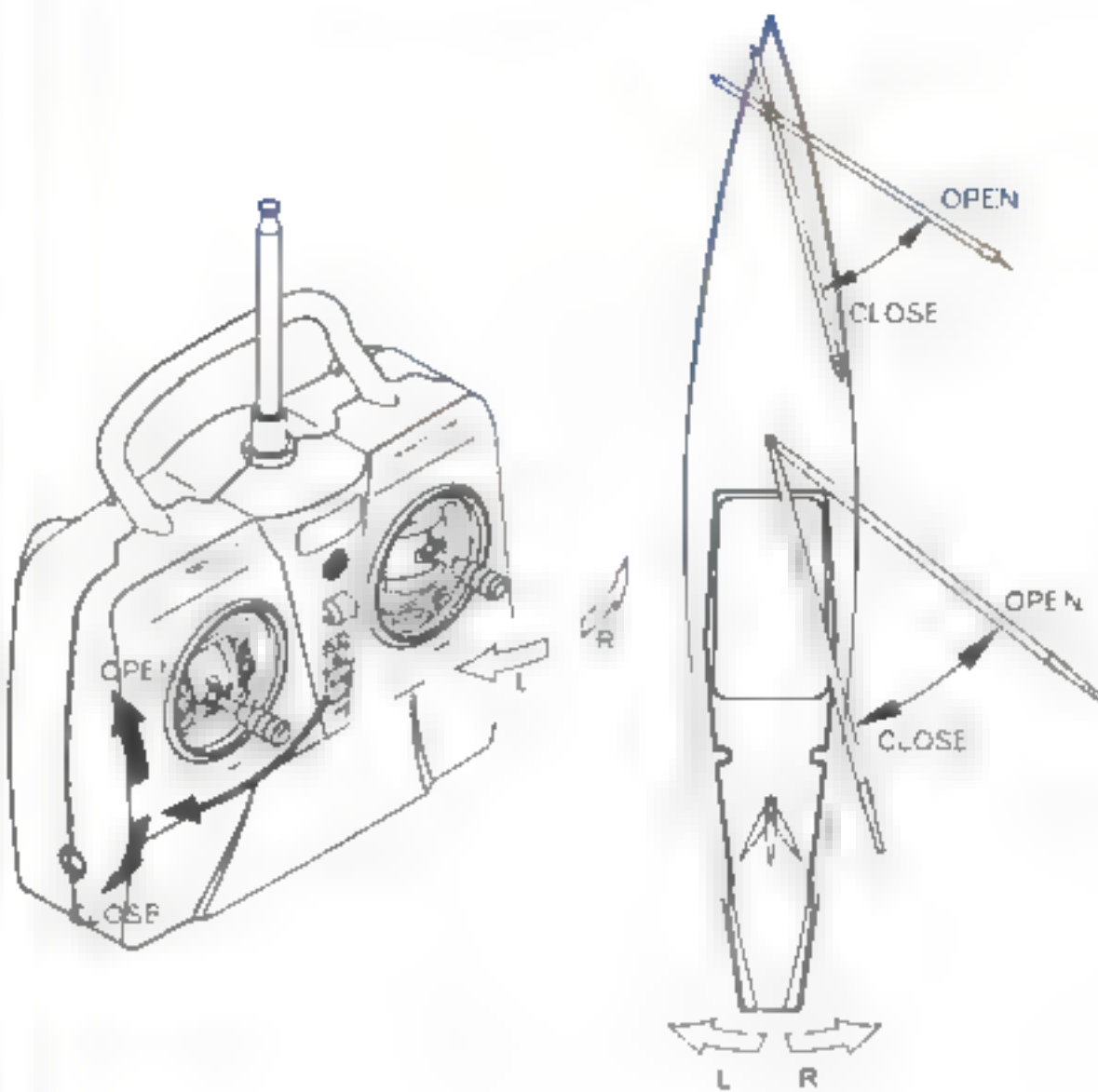
Preparations for Sailing

Before sailing your ETNZ for the first time take note of the following

- Using clear tape seal the radio hatch cover after turning on your radio to prevent water from entering the hatch.
- Make sure that your transmitter antenna is extended completely. Make sure that the receiver antenna is completely uncoiled (either inside or outside the hull).
- Always turn the transmitter on before the receiver, likewise turn the receiver off before the transmitter.
- Check that each sail line snap and fitting is properly installed and adjusted.

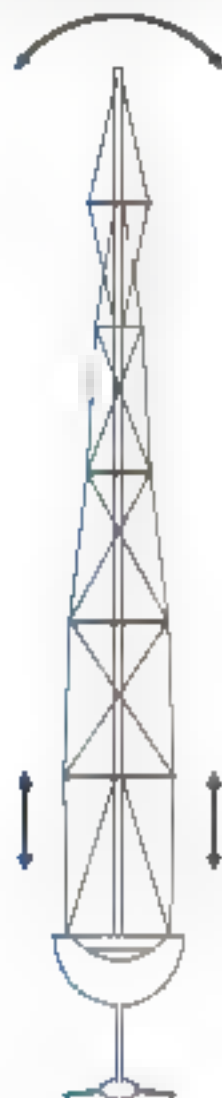
CAUTION:

On very windy days periodically check all knots if loose and the inside of the hull to make sure that there is no excessive accumulation of water.



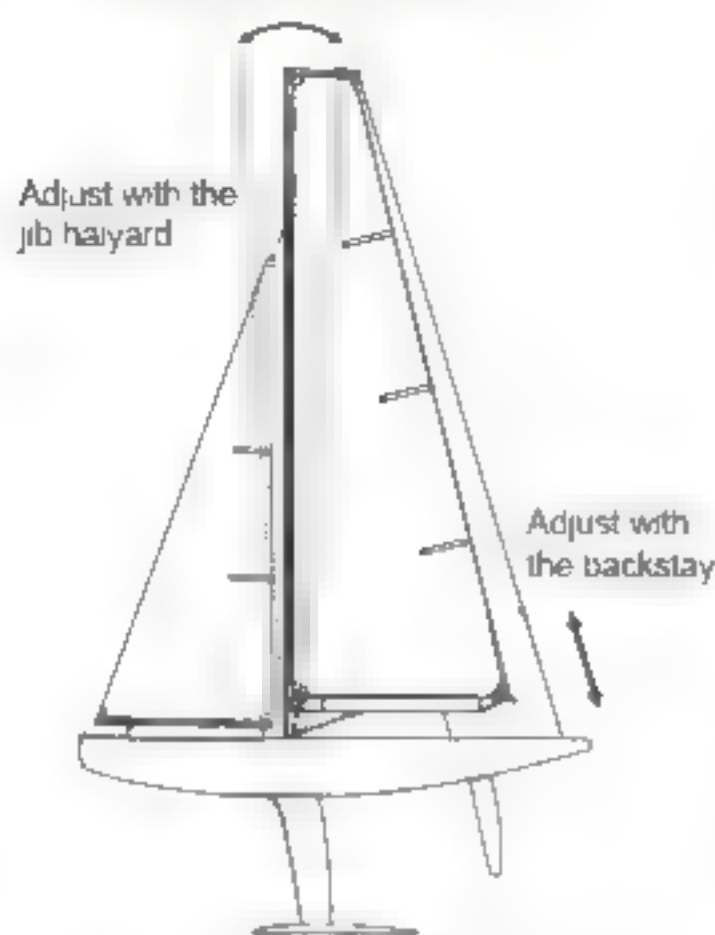
Tuning Your ETNZ for Proper Operation

Straighten any left or right leaning of master

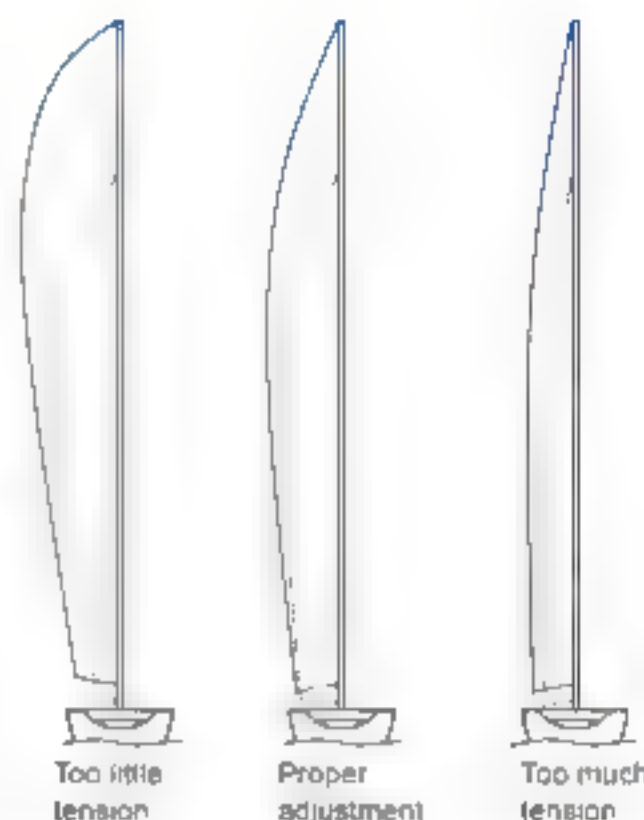


Tighten or slacken the adjuster in order to straighten the mast.

Straighten any forward or backward inclination of master

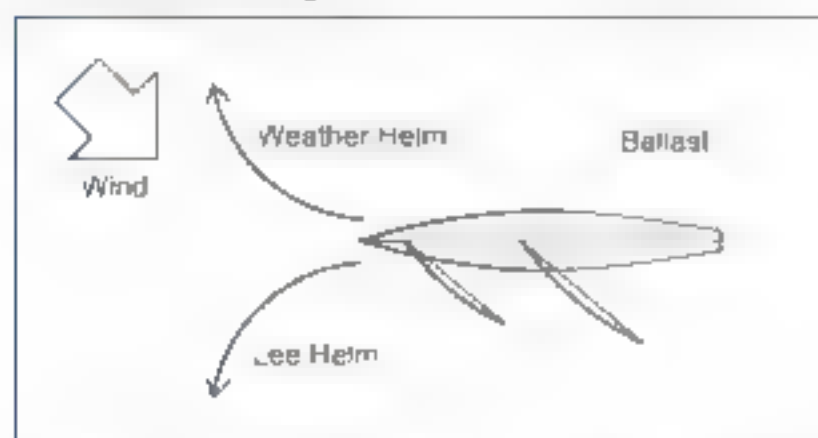


- 1 If your boat comes weather helm, incline the mast a bit forward
 2. If your boat comes lee helm, incline the master a bit backward
- Refer to the explanation of weather helm and lee helm below



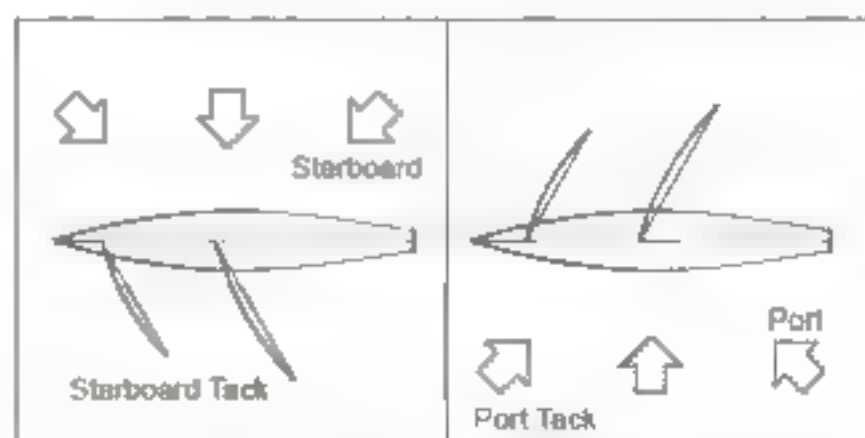
Maintaining an optimum sail profile is important for both speed and control. You may need to make some finer adjustments to your tuning to obtain the sail profile you want. The sail profiles shown in the figure are viewed from behind

Mast Adjusting



Weather Helm and Lee Helm

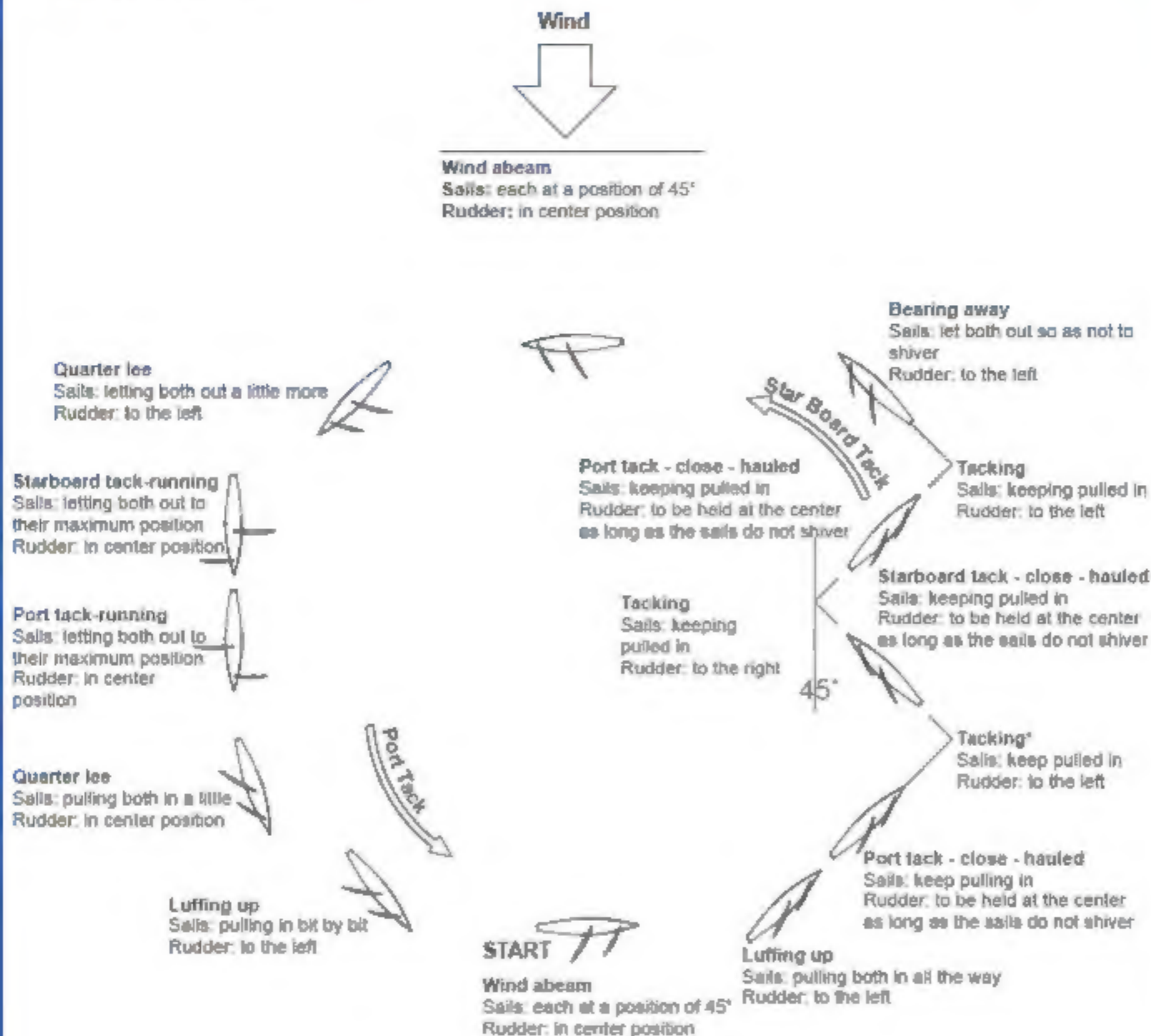
With the Rudder in line with the Keel, if the boat tends to turn windward, it is said that the boat comes weather helm. If it tends to turn leeward, it is said that it comes lee helm. The situation in which the boat shows neither tendency is called balanced helm. In general, a boat carrying a slight weather helm is better in performance than one carrying lee helm or having balanced helm. Therefore, after adjusting the boat to balanced helm re-adjust it so that it comes slight weather helm.



Starboard Tack and Port Tack

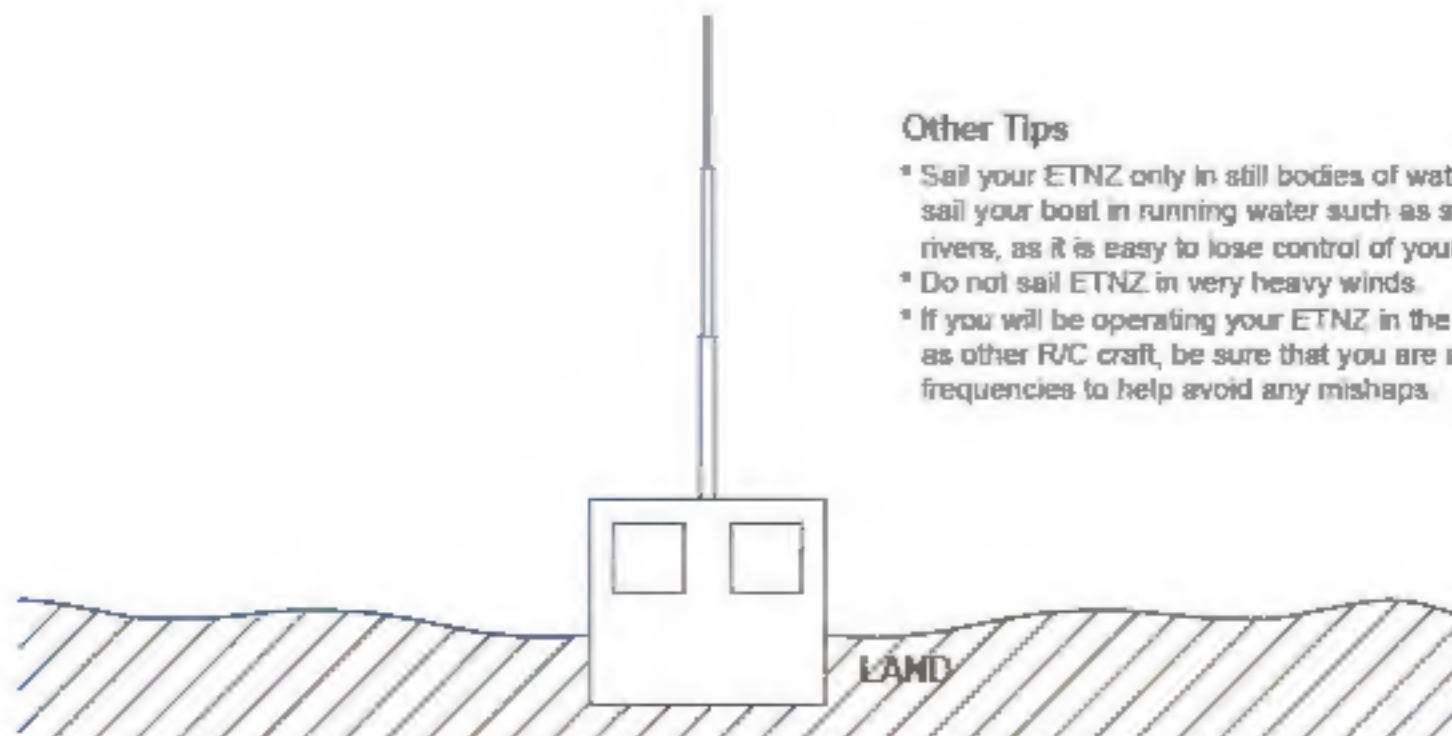
The right side of the boat is called starboard and the left side of boat is called port. When the yacht sails with the wind cross the starboard and the mainsail is on the port side, it is said that the boat is on a starboard tack. When it sails with the wind cross the port and with the mainsail on the starboard, it is said that boat is on a port tack. You can sail on a starboard or port tack when sailing close-hauled (i.e. windward), wind abeam (i.e. leeward).

Principle of Sailing

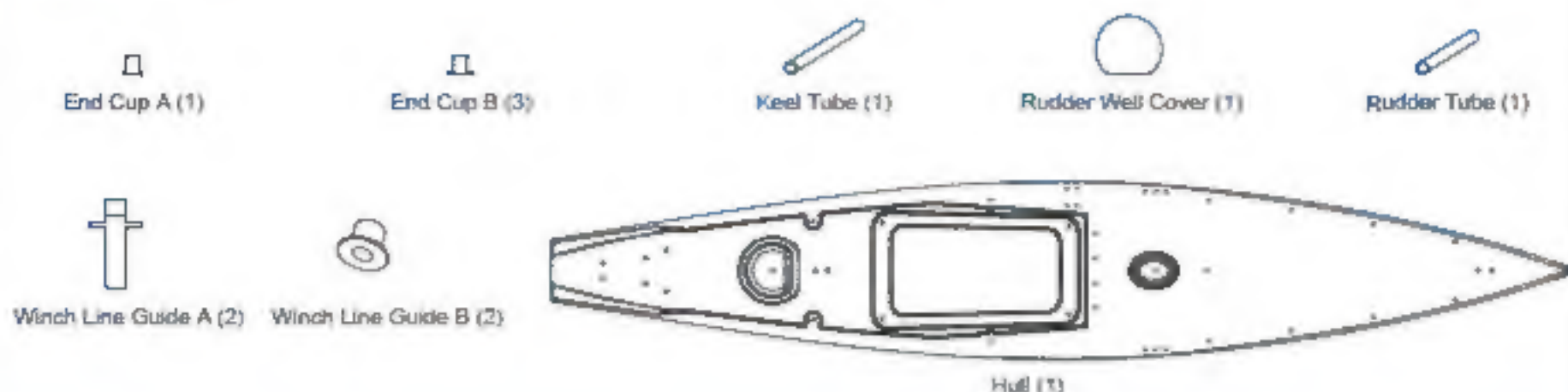


Other Tips

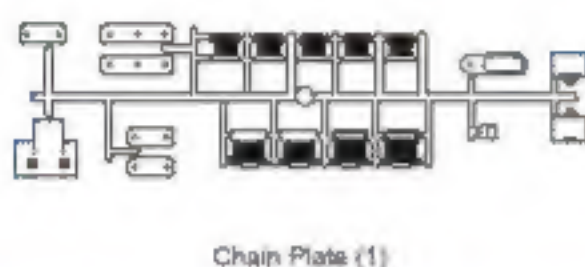
- * Sail your ETNZ only in still bodies of water. Never sail your boat in running water such as streams or rivers, as it is easy to lose control of your boat.
- * Do not sail ETNZ in very heavy winds.
- * If you will be operating your ETNZ in the same area as other R/C craft, be sure that you are all on different frequencies to help avoid any mishaps.



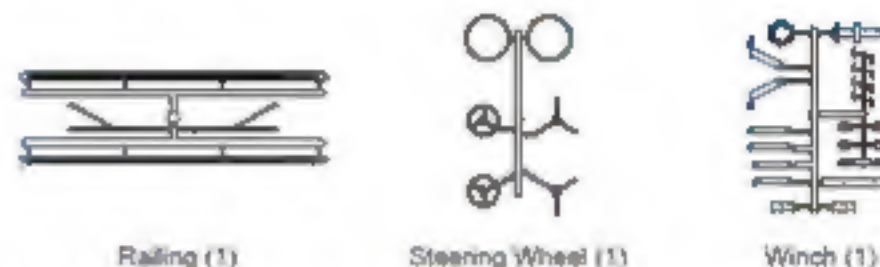
PJ6051 Hull



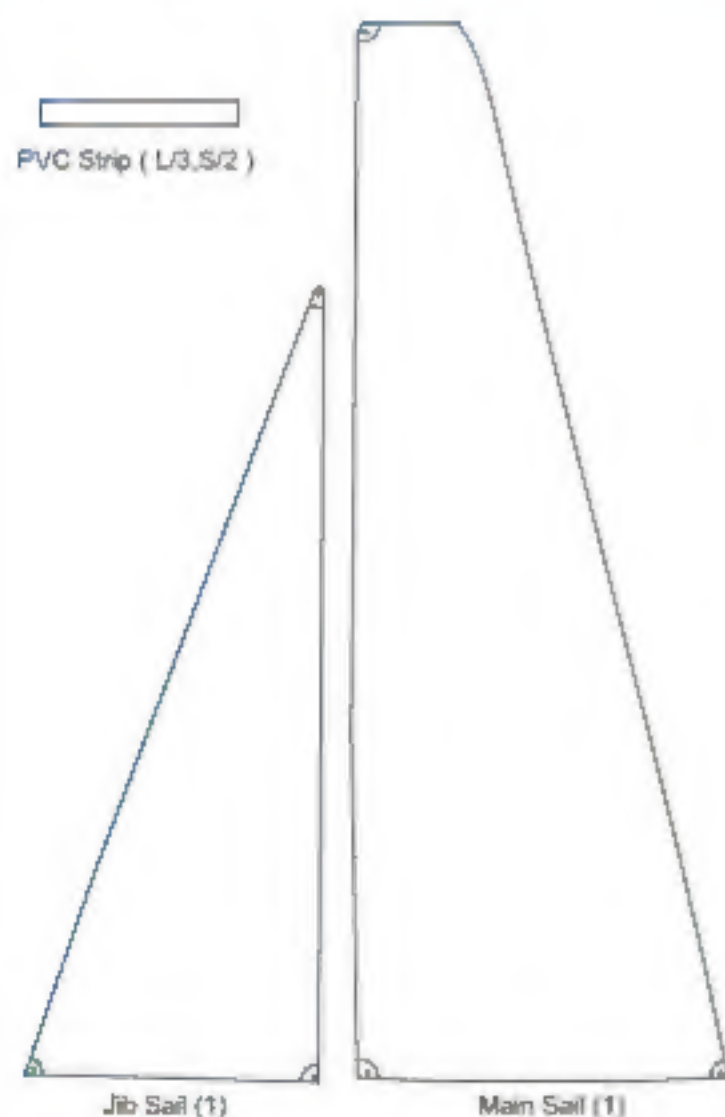
PJ6052 Decoration Set A



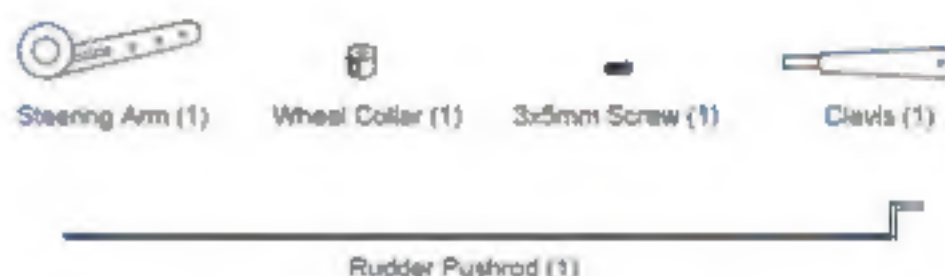
PJ6053 Decoration Set B



PJ6072 Sails



PJ6055 Rudder Linkage



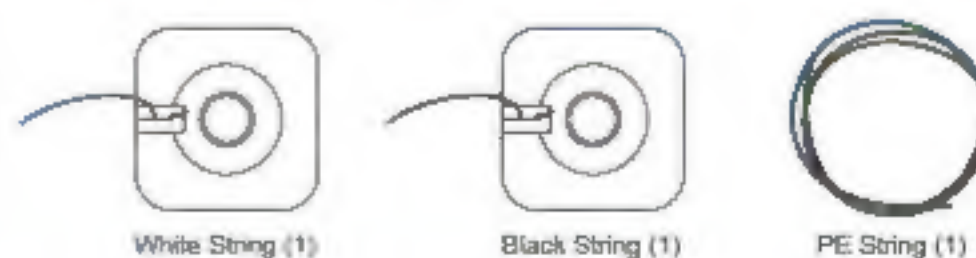
PJ6057 Head Crane



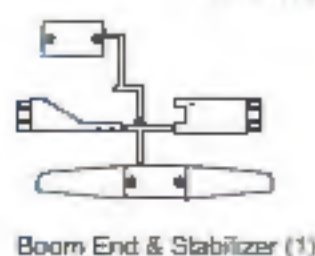
PJ6058 Spreader



PJ6073 Rigging String



PJ6060 Boom End & Stab.



PJ6061 Boom Retaining Set



PJ6062 Swivel



PJ6063 Winch Servo Horn Cover



PJ6064 Boat Stand



Display Stand (2)



Al. Stand A (4)



Al. Stand B (2)



3x15 mm
Self-tapping Screw (4)

PJ6065 Screw



M4 Locknut (1)



3x8 mm
Sink Screw (4)



3x10 mm
Self-tapping Screw (8)



2x12 mm
Wood Screw (8)



2x8 mm
Self-tapping
Screw (20)



M3 Locknut (4)



3x25 mm
Self-tapping
Screw (2)



4x32 mm
Wood Screw (1)



M2 Nut (8)

PJ6067 Foam Tube



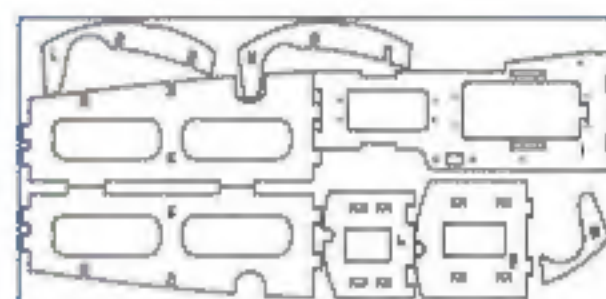
Foam Tube (2)

PJ6066 Rudder



Rudder (1)

PJ6068 Servo Tray



Servo Tray (1)

PJ6070 Keel



Ring (3)



M4 Locknut (2)



Keel (1)

PJ6071 Boom



Jib Boom (1)



Main Boom (1)

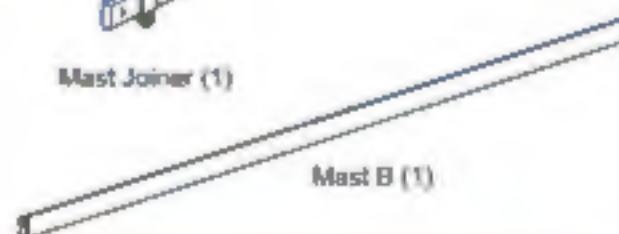
PJ6054 Mast



Mast A (1)



Mast Joiner (1)



Mast B (1)

PJ6056 Hatch Cover



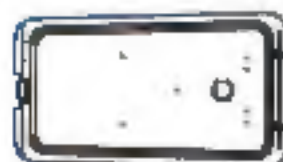
Silicone Tube (1)



Mount A (1)



Mount B (1)



Hatch Cover (1)



Hatch Mount (1)

PJ6059 Ballast



3x8 mm Sink Screw (2)



Ballast (1)

PJ6074 Decal

NZL-84 NZL-84



0123456789

Decal (1)

AMERICA'S CUP RACING YACHT

No.5555

Specifications

Length: 39"(993mm)

Beam: 6.75"(172mm)

Sail Area 744sq.in.(48dm²)

Mast Height: 51.4"(1306mm)

Overall Height: 67"(1700mm)

Overall Weight: 3.5 Kg(7.7 lb.)

